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PRELIMINARY TABLE OF SOLAR SPECTRUM  
WAVE-LENGTHS

I



PRELIMINARY TABLE  
OF  
SOLAR SPECTRUM WAVE-LENGTHS

BY  
HENRY A ROWLAND

PART I

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## PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS I

By HENRY A ROWLAND

THE following table of the lines of the solar spectrum has been in course of preparation at the Johns Hopkins University for many years in connection with an investigation of the spectra of the elements. The spectrum of every known element, except gallium (of which I have no specimen), has been photographed in connection with the solar spectrum, and some of these plates have been measured.

The whole solar spectrum has now been measured except the extreme ends, and the wave-lengths have been mostly reduced to my table of standards. Many of the lines, especially the stronger ones, have been identified with respect to the substance producing them, but this must be a labor of years. Hence I have determined to publish the work so far as I have now proceeded, expecting to add to it and correct it for a term of years, until I can publish a standard list of the lines of the solar spectrum with all the elements to which they belong.

The wave-length measurements have been made from my photographs of the solar spectrum, extending at present down to about wave-length 7200, and they will probably not be much changed in the future. The figures in the table refer to the wave-lengths in air at 20°C and 76<sup>cm</sup> of mercury, as they are based upon the table of standards.

The intensities of the solar lines go from 1, a line just clearly visible on my map, up to 1000 for the H and K lines. Below 1 the lines in the order of faintness proceed from 0 to 0000, indicating lines more and more difficult to see.

The ordinary scale from 1 to 10 or from 1 to 6 is far too limited for the spectral lines, especially for the metallic spectra, 1 to 1000 is hardly great enough for the enormous difference in intensity. The small range, 1 to 10, ordinarily used gives an

entirely wrong idea to the worker in this subject, and many books with spectroscopic theories might have been saved by using a scale from 1 to 1000

The expenses of this work have been partly borne by appropriations from time to time by the Bache fund of the National Academy of Sciences, the Rumford fund of the American Academy of Sciences, and the Bruce fund of Harvard College Observatory

The measurement and calculation of wave-lengths have been made most carefully by Mr L E Jewell

My thanks are due to very many friends for assistance in procuring pure and rare elements, etc

The symbols used are as follows A line that is not clearly defined, or that is much weaker than it should be for a line of its breadth, is indicated by an N (such a line may generally be considered as composed of two or more lines too close together to be separated) Two lines close enough together to be considered double are indicated by a d, and a double whose components are very difficult to separate is indicated by d', likewise three lines so close together as to be considered a triplet are indicated by a t

Where several lines are connected by a large brace there is generally shading extending from the center of some strong line to other lines at the extremities of the braces This is the case with the stronger lines of iron and some other elements

In the column devoted to the identification of the solar lines an interrogation mark indicates that the identification of the solar line with the element given is uncertain Where two or more elements are given, the solar line is compound The order in which they are given indicates the portion of the line due to each element, as follows C-Fe-Cr However, it is not always possible to correctly assign the exact positions, and consequently there are probably many errors in the positions assigned Where the solar line is too strong to be due entirely to the element with which it is identified, it is represented thus —Fe, and indicates that the iron line is coincident with the red side of the

solar line, the origin of the rest of the line being unknown. If, as far as can be determined from the plates, two metallic lines coincide exactly with the same portion of a solar line, this is shown by using a comma instead of a dash. Thus Fe, C<sub>1</sub>. In some cases when a double line is particularly difficult to separate, measurements are given on the two components and also on the line unresolved. This last measurement is placed in parenthesis between the other two measurements. Thus

W L	INTENSITY
3738.454	3
(3738.466)	6
3738.505	2
	d

means that there is a line at  $w-l$  3738,466 with the intensity 6, and that with good definition this line may be resolved into two components having the intensities 3 and 2 and the given wave-lengths

JOHNS HOPKINS UNIVERSITY,  
Baltimore, Dec 1894

# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS XIV<sup>1</sup>

By HENRY A. ROWLAND

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
2975 587	Cr	o	2985 999	Cr?	ooo
2975 766		ooo	2986 109	Cr	ooo
2976 036		o Na?	2986 239		ooo
2976 191		ooo	2986 379		ooo
2976 316		ooo	2986 579	Cr	o
2976 801		ooo	2986 749		oo N
2977 021		oo Nd?	2986 999		oooo
2977 331		ooo N	2987 169		ooo
2978 151		ooo N	2987 289		ooo
2978 316		oooo N?	2987 439	Fe?	ooo
2978 670		ooo N	2987 959		oooo N
2979 480		oo	2988 144		oo N
2979 670		oooo N	2988 333		ooo N
2979 860		o N	2988 598		ooo
2980 080		o Nd?	2988 733	Cr	oo
2980 330		oo	2988 873		ooo
2980 490		ooo	2989 038		o N
2980 690		oo	2989 298		oo
2980 915		o	2989 523		ooo
2981 070		oo N	2989 708		i
2981 990		ooo N	2989 828		ooo
2982 180		oo	2990 008		ooo
2982 340	Ca, Fe?	ooo N	2990 173		oo
2982 530		oo N	2990 438		o
2982 885		ooo	2990 523	Fe?	i
2983 649 <sup>2</sup>		oooo N	2990 718		oo
2983 764		ooo N	2990 788		ooo
2984 414		oooo	2990 968		oo
2984 654 <sup>3</sup>		oo	2991 203		o
2984 849 <sup>3</sup>		ooo N d?	2991 318		ooo
2985 119 <sup>4</sup>		ooo N d?	2991 538		ooo
2985 359		oooo N	2991 738		oo
2985 439		oooo N	2992 188		ooo Nd?
2985 629		ooo	2992 488		oooo

<sup>1</sup>When the publication of the table was commenced in the first volume of this JOURNAL, the calculations of wave lengths in the extreme ultra violet was not completed. These wave lengths will be published in this and subsequent numbers of the JOURNAL.

<sup>2</sup>Strong line of iron at 2983 689. The strong *shaded* lines of iron and some other elements are with difficulty seen in the faint beginning of the ultra violet solar spectrum, and as a consequence their intensities are much less than in corresponding metallic spectra.

<sup>3</sup>Violet portion of line partly due to a line of overlapping yellow.

<sup>4</sup>Red portion of line partly due to a line of overlapping yellow.

Wave length	Substance	Intensity and Character	Wave-length	Substance	Intensity and Character
2992 693	N <sub>1</sub>	0	3002 433	N <sub>1</sub> Fe, , Fe	000
2992 828		0000	3002 593		00
2993 027		000	3002 743		00
2993 177		000	3003 102		0 N
2993 327		000	3003 182		1 N
2993 457		000	3003 312		000
2993 807		0000	3003 572		0 Nd?
2993 927		00	3003 773 <sup>1</sup>		2 Nd?
2994 177		00	3003 962		00
2994 327		000 N	3004 230		00
2994 527 s	Fe, N <sub>1</sub>	000	3004 572	Cr Fe?, , Co?	000
2995 057 s	Ca	000	3004 732		1
2995 212	Cr, Co	00	3004 912		000 N
2995 347		000	3005 160 s		3
2995 597		00	3005 407 s		3
2995 767 <sup>3</sup>		00	3005 572		000 Nd?
2995 937		000	3005 852		2 d
2996 096		2	3006 059		0
2996 187		000	3006 262 <sup>2</sup>		0 Nd?
2996 347		0000	3006 482		000 Nd?
2996 495	, Fe?	2	3006 677	Ca , Fe Fe	0 Nd?
2996 689	Co?, Cr	1	3006 982 s		0
2996 940		1	3007 237 s		1 N
2997 067		000	3007 405 s		1 Nd?
2997 317		00	3007 592		00 N
2997 437 s	Ca, Cu?	2	3007 757		00
2997 602		000	3007 862		000
2997 787		00 N d?	3008 072		000
2998 066		0	3008 212 s		00
2998 266		00	3008 312		00
2998 451		0	3008 582	Fe Mn?	00
2998 606		00	3008 744		00 N
2998 776		000	3008 914		0 Nd?
2998 916	C <sub>1</sub>	2	3009 022		00
2999 136		0000	3009 190		0000
2999 286		00	3009 302 s		1
2999 603 s	Fe,	00 N	3009 462		1
2999 748 s	Ca	0	3009 642 s		00
2999 923		000	3009 822		2 N
3000 043		000	3010 277	Mn?	1 N
3000 178		00	3010 522		0
3000 458		00	3010 731		00
3000 553	Fe,	00	3011 257		0
3000 693	Co,	00	3011 390		00 N
3000 913	Li?, Ca	000	3011 527		00
3001 103 s	Cr, Fe	00 Nd	3011 597		00
3001 373		00 Nd	3011 747		1 N
3001 763		000	3011 832		000
3002 093		000 N	3011 907	Ni,	00
3002 288		000	3012 146 <sup>2</sup>		00 N

<sup>1</sup> Red portion of line partly due to a line of overlapping yellow<sup>2</sup> Violet portion of line partly due to a line of overlapping yellow<sup>3</sup> Very strong shaded non lines

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3012 247		ooo N	3020 936		ooo N
3012 557 s		2	3021 170 <sup>a3</sup> s	Fe	3
3012 707		ooo	3021 346		ooo N
3012 827		ooo N	3021 516		oooo N
3013 037		o	3021 676	Cl	1
3013 169	Cl <sup>2</sup>	1	3021 821		oooo N
3013 227		o	3022 001		ooo N
3013 437		oo Nd <sup>2</sup>	3022 216		oooo Nd <sup>2</sup>
3013 691	Co	oo	3022 371		oo
3013 840	Cl	1	3022 476	Co	o
3014 067		ooo	3022 693		1
3014 215 s		o	3022 861	Mn	1
3014 282 s		1	3023 011		oooo
3014 427		oo	3023 178 <sup>a</sup>		2 N
3014 552		ooo N	3023 416		ooo
3014 752	Mn <sup>2</sup>	ooo	3023 559		oo N
3014 878		1	3023 796		ooo N
3015 049	Cl	1	3023 984		o Nd <sup>2</sup>
3015 300	Cr	2	3024 156 s	Fe	4 Nd <sup>2</sup>
3015 467		ooo	3024 326		ooo
3015 617		2	3024 465 s	Cr	4
3015 799	Co	ooo	3024 756		ooo Nd <sup>2</sup>
3015 917		ooo	3024 908		1
3016 047	Fe <sup>2</sup>	2	3025 095		1 Nd <sup>2</sup>
3016 300 s	Fe,	4 Nd	3025 385 s		3
3016 557	Mn <sup>2</sup>	oo	3025 571		oooo N
3016 622		oo <sup>b</sup>	3025 737	-,Fe <sup>2</sup>	2 N
3016 869		2	3025 961 s	Fe	2 N
3016 957		1	3026 131		oo N
3017 127		oooo	3026 331		ooo N
3017 308	Li <sup>2</sup>	1	3026 486	Co	o
3017 361	Co <sup>2</sup>	o	3026 591	Fe,	3
3017 516		o	3026 761		2
3017 691	Co, Cr	1 Nd <sup>2</sup>	3026 931		1
3017 786 s	Fe,	1 N	3027 069		o
3017 961		oo	3027 141		o
3018 086		ooo N	3027 291 s	Fe	ooo N
3018 248		1	3027 481		ooo N
3018 361		oo	3027 717		o
3018 601	Cl,	2	3027 811		1
3018 919	Cr	1	3027 999		ooo N
3019 078 s	, Fe	1 N	3028 128 <sup>a</sup>		3
3019 271	Ni	1 N	3028 243		1
3019 426		1	3028 403		oo
3019 666		oo <sup>no</sup>	3028 561		oo Nd <sup>2</sup>
3019 986		oo N	3028 716		o
3020 106		o N	3028 806		o
3020 346		ooo N	3028 980		1
3020 606 <sup>3</sup> s	Fe	oo N	3029 134		1 Nd <sup>2</sup>
3020 826 <sup>3</sup> s	Cr, Fe	oo Nd <sup>2</sup>	3029 261	Cl	1

<sup>a</sup>Violet portion of line partly due to a line of overlapping yellow<sup>3</sup>Very strong shaded iron lines

# TABLE OF SOLAR SPECTRUM WAVE-LENGTHS

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Wave-length	Substance	Intensity and Character	Wave-length	Substance	Intensity and Character
3029 369	Fe?	5	3037 510 5	Fe	10 N
3029 441		0 N	3037 685		0
3029 661		000	3037 895		0
3029 835	Li?	4	3038 050	Ni	3
3029 936		000	3038 210		1
3030 091		1	3038 423	Co?	2
3030 261	Fe	3	3038 625		1
3030 356	Cl	2	3038 860		3
3030 591		000	3039 095		1
3030 720		1	3039 170		2
3030 881		000 N	3039 309		0000
3031 046		1	3039 433		2
3031 161		0	3039 660		0
3031 312	Fe	1	3039 721	Co,	2
3031 454	Co, Cl	1	3039 883	Cl	2
3031 591	Cr?	00 N	3040 030		0000
3031 741	Fe	1	3040 130		000
3031 821		1	3040 340		0000
3031 975	-, Ni?	3	3040 435		1
3032 141		0000	3040 550	Fe	3
3032 336		000 N d'	3040 712	Mn	1
3032 567		1	3040 865		0
3032 741		0000	3040 950	Cl	2
3032 971		0000	3041 060		2
3033 026		3	3041 145		0
3033 211		2	3041 325	Mn?	00 N
3033 321		0000	3041 532		0 Nd?
3033 532		5	3041 740	Fe	2
3033 718		0	3041 867	Fe	2
3033 918		2	3042 005		00
3034 036		000	3042 150	Fe	3
3034 166		00	3042 365		0
3034 304	Cl	2	3042 592	Co	0
3034 558	Co,	2	3042 765	Fe	3
3034 669		3	3042 957		0
3034 911		00	3043 239		0
3035 098		0	3043 456	Mn?	1
3035 341		0	3043 648		1
3035 468		1	3043 870	Mn?	0000
3035 581		000 N	3043 970		1
3035 847 5		5	3044 112 5	Co	3
3036 001		00	3044 220		000
3036 215	Ca?	0	3044 345		0
3036 370		00	3044 442		0000
3036 505		0	3044 671 5	Mn	3
3036 625		00	3045 100	-, Ni	3 } d
3036 880		1 Nd?	3045 183	Fe	4 }
3037 085		00	3045 440		000 N
3037 160	Cr	2	3045 560		0000 N
3037 330		1 N	3045 695	Mn,	3



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3045 870	,Mn?	2 N	3053 856		1
3046 025		0000	3053 988	C <sub>1</sub>	3
3046 150		0	3054 429	Mn, N <sub>1</sub>	10
3046 375		00	3054 807	,Co	1
3046 610		00	3054 931		0
3046 778 s	T <sub>1</sub> ,	5	3055 051	Z <sub>1</sub>	0
3046 919		0	3055 233		0
3047 041		1	3055 374	Fe	4
3047 158	Mn	1	3055 428		2
3047 311		0	3055 563		0
3047 471		0 N	3055 701		0000
3047 725 s	Fe	20 N	3055 814 } s		2
3047 911		1 Nd?	3055 861		0
3048 151	,Co	0 Nd?	3056 021		0000 N
3048 327		1	3056 221		0
3048 449		000	3056 339		1
3048 563		3	3056 441		1
3048 701		000 Nd?	3056 691		0
3048 893		1	3056 861	T <sub>1</sub>	2
3048 999	Mn, Co	2	3056 901		1
3049 124		0	3057 117		00 N
3049 261		00	3057 257		1
3049 462		3	3057 382		00
3049 649		2	3057 552 s	T <sub>1</sub> , Fe	20
3049 856		000 N d	3057 753	N <sub>1</sub>	2
3050 001		000 N	3057 907		1 N
3050 186 } s		2	3058 072		00
3050 231 } s		4	3058 189	T <sub>1</sub>	4
3050 374		0000	3058 457		1
3050 501		0000	3058 605		1
3050 623	Co	000	3058 812		0
3050 771		1	3059 012		1 N
3050 943	N <sub>1</sub>	5	3059 212 s	Fe	20
3051 156		1	3059 377		0
3051 351		0000	3059 482		0
3051 528		2 N	3059 616		2
3051 721		000 N	3059 845	T <sub>1</sub>	3
3051 896		00	3060 137	,Co	1
3052 091		000 N	3060 192		00
3052 256		00	3060 337		00
3052 331	Cr?	0	3060 450		1
3052 396		0	3060 552		1
3052 591		1	3060 652	Fe?	1
3052 694		0	3060 727		1
3052 891		0	3060 878		2
3053 031		00	3061 093 s	Fe?	3
3053 173 s	Fe	4	3061 259 <sup>1</sup>		00 N
3053 341		000 N	3061 487	Z <sub>1</sub>	00 N
3053 530 s		7 d?	3061 682		0
3053 764		0	3061 772	C <sub>1</sub> ?	00

<sup>1</sup> Red portion of line partly due to a line of overlapping yellow

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3061 931 s	Co	3	3069 288		2
3062 082		00	3069 441		1
3062 222	Mn	1	3069 562		2
3062 358	Co,-	4 N	3069 788		1
3062 622		00	3070 022		1
3062 795		00	3070 145		0
3062 969		3d?	3070 372	Mn	3
3063 152		0000	3070 487		00
3063 282		1	3070 599		1
3063 348		3	3070 802		0
3063 512	Cu	000	3070 902		0
3063 612		2	3071 112		00
3063 662		3	3071 252		1
3063 836		2	3071 360	Ti	3
3063 912		00	3071 542		00
3064 043	Fe?	2	3071 662	-,Ba	00
3064 122		1	3071 784		0
3064 323		2	3071 905		00
3064 475	Co	1	3072 072	Co	1
3064 622		000	3072 222	li	3
3064 729	Ni	3	3072 289		0
3064 802		1	3072 435	Co	3
3064 936		1	3072 602		1
3065 062		1	3072 777		000
3065 201	Cr?	2	3073 091	li,	6 Nd?
3065 423		1	3073 232	Mn,	1
3065 602		0000	3073 342		2
3065 722		00	3073 477		0000
3065 882		0000 Nd?	3073 632	Co	00
3066 101	-,Mn	2	3073 784	Cr	1
3066 251		0	3073 939	Cu,-	0
3066 334	Ti	2	3074 104	Fe?	1
3066 471	Ti	1	3074 262	Fe?	2
3066 608	Ti, Fe?	2	3074 492		1
3066 793		000	3074 542	Fe?	2
3066 923		000	3074 803		0
3067 101	Fe?	1	3075 012		000 N
3067 230	Fe	2	3075 142		000
3067 369 s	Fe	8	3075 212		0
3067 493		1 N	3075 346 s	Ti	3
3067 764		1	3075 462		0
3067 895		1	3075 562		0000
3068 046		2	3075 702		0 N
3068 283	Fe	2	3075 840 s	Fe	3
3068 388		1	3076 002		1
3068 583		1	3076 105		1
3068 705		1	3076 372		0
3068 832		1	3076 542		1
3068 903		0	3076 692		0000
3069 053		00	3076 857		0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3076 938		0	3083 957		00
3077 134		0	3084 162		00
3077 295 s	l e	3	3084 272		0000
3077 332 s		1	3084 397		000
3077 502		0000 Nd?	3084 562		0
3077 665		0	3084 682	Cl?	00
3077 747		1	3084 792		0000
3077 842	Fe?	0	3084 902		0000
3077 942	Cr	0	3085 004		1
3078 151 s	Fe?	4 d?	3085 150		0
3078 359		0	3085 313		2
3078 494		2	3085 438	Fe?	1
3078 552	Fe	3	3085 502		1
3078 769 s	li,	8 d?	3085 652		0000
3078 932		000	3085 780		1
3079 022		00	3085 827		1
3079 212		000 Nd?	3085 972		000
3079 415		00	3086 102		000 N
3079 482	Co	0 N	3086 217		000
3079 724 s	Mn	2	3086 335		0
3079 862		0000	3086 503	Co	1
3079 932		000	3086 636		2
3080 086	Fe?	4	3086 742		00
3080 223	Fe?	1	3086 893 s	Co	4
3080 352		0	3087 094		000
3080 475		1	3087 182 s	Li	1
3080 529		00	3087 451		1
3080 702		00	3087 559		0
3080 864 s	,Ni	5	3087 639	Cl?	000
3080 984	Cd	00	3087 799		00
3081 112		1	3087 949	Co	0 Nd?
3081 354		2	3088 145 s	li	7 d?
3081 419	Mn,	3	3088 294		0 N
3081 567		0	3088 461		1
3081 657		1	3088 716		00
3081 787		1	3088 858		2
3081 832		1	3088 929		0000
3081 947		0	3089 106		0
3082 142	Mn?	1	3089 202		000
3082 275 s	Al	5	3089 509	li	1
3082 632		00	3089 614		00
3082 734	Co	2	3089 719	Co	3
3082 957	Co	00 N	3089 851		2
3083 149		1	3089 974		2
3083 275		1	3090 328	li?, Fe?, Co	1 N
3083 389		1	3090 480		1
3083 489		00	3090 592		0
3083 610		0	2090 839		00
3083 727		00	3090 974		0
3083 859 s	l e	4	3091 177	,Mg	4

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3091 319		1 N	3097 935		000
3091 477		1	3098 070		000
3091 689	Fe	4	3098 177		0
3091 799		00	3098 298	Fe, Co	2
3091 976		0	3098 430		0000
3092 199		0	3098 560		000
3092 339		0000	3098 693		2
3092 509		1	3098 825		000
3092 579		00	3098 930		00
3092 704		0000	3099 073		00
3092 818 s	Al	4	3099 220	Ni,	2
3092 957 s	Al	1	3099 340	Zi	0
3093 089	Mg	1	3099 523		1
3093 229		2 N	3099 680		0 N
3093 452	Fe	1	3099 780	Co	000
3093 604		0	3099 895		000
3093 714		00	3100 001 }	Fe	3
3093 829		000	3100 092 }	Fe	3
3093 929	Fe	1	3100 255		00 N
3093 989		1	3100 430 s	Fe, Mn	4 N
3094 049	Fe, Cu?	000	3100 629		000
3094 174		0000	3100 787 s	Fe, li	3
3094 311		1	3100 944	Fe, Co?	1
3094 401		1	3101 047		0
3094 470		00	3101 117	Fe	1
3094 575		00	3101 347		1
3094 732 s		2	3101 522		00 N
3094 830		0000	3101 679 s	Ni	4 N
3095 003 s	Fe?	4	3101 799		00 N
3095 190		0	3102 000 s	Ni	3
3095 360	Fe	2	3102 079		00 N
3095 453		3	3102 253		1
3095 660		00 N	3102 404	V	3
3095 830	Co	00 Nd?	3102 474	, Co	2
3095 990	Cr,	0	3102 624		0000
3096 145		1	3102 748		0
3096 244		2	3102 869		00
3096 430		0	3102 987	Fe	1
3096 510	Co	0	3103 084		0
3096 655	Ci?	000	3103 214		0000 Nd?
3096 730		0	3103 389		0
3096 870	Co,-	000 N	3103 454		1
3097 008	, Mg	5	3103 599		00
3097 235	Ni	2	3103 719		0000
3097 282	li	1	3103 886	Co, Fe?	2
3097 460		000	3103 924	li, Fe?	3
3097 538		00	3104 087	, Co	00
3097 595		00	3104 269		0
3097 723		00	3104 379		0000
3097 890		1	3104 454		00

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3104 676		2 N	3112 183	Fe, Ti?	2
3104 819		00	3112 320		1 N
3104 884		0000	3112 575	Ti?	00
3105 019		00	3112 715		0000
3105 199	I <sub>1</sub>	2	3112 790		00
3105 279		1	3112 910		0000
3105 429		0000	3113 060		00
3105 569	,Ni	2	3113 203		00
3105 668		1	3113 320		0000
3105 782		1	3113 490		1
3105 999	Co?	0000 N	3113 560	Co	0
3106 137		2	3113 698	Fe?	1
3106 346	Ti	3	3113 773		0
3106 661	Zr	2	3113 945		0 N
3106 914	Ti	000	3114 185	I <sub>1</sub> ?	1
3107 012		1	3114 232	,Ni	3
3107 197	Co,	00 N	3114 423		2
3107 427		0	3114 460		1
3107 561		0	3114 590		0000
3107 670		1	3114 735		00
3107 830	Ni?	0	3114 780		0
3107 959		00	3114 885		1
3108 089	Fe?	1	3115 150 s	Fe	1 N
3108 239		0000 N	3115 390		0
3108 369		00 N	3115 460		0
3108 469		0000	3115 575		0
3108 661	Cu?	00	3115 670		00
3108 787		0	3115 775		1
3108 991		0	3115 990		0
3109 057		1	3116 160		0000 N
3109 179		1	3116 370	Fe?	1
3109 339	,Cl	3	3116 500		0
3109 609	Co	00	3116 610	Fe?	1
3109 729		1	3116 741	Fe	2
3109 909		0000	3116 835		1
3110 031		00	3117 025		0
3110 190	Co,	1	3117 090		1
3110 351	Fe?	5 Nd?	3117 145		00
3110 635		00	3117 309		1
3110 810	I <sub>1</sub> , V	5 Nd?	3117 357		0
3110 955	Co, Fe?	2	3117 540	I <sub>1</sub> ?	00 N
3111 000	Cl, Zr	1	3117 770	I <sub>1</sub> , Fe?	2
3111 180		0000	3117 877		1
3111 285		00	3117 998		2
3111 410	Co?	00 N	3118 249	I <sub>1</sub> ?	1
3111 530		0000	3118 360	Co	0
3111 640		0000	3118 498	V	3
3111 791	Fe?	1	3118 665		00
3111 920	Fe?	2	3118 764	Cl,	2
3112 050		00	3118 935		0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3119 144		00	3126 319	V, Fe	5
3119 307	-,Cl	1 Nd?	3126 444		000
3119 460		00	3126 584		00
3119 613	Fe	3	3126 729		1
3119 787	Ti?, Cr	1	3126 879	Co	1
3119 911	Ti	1	3126 959		0
3120 121		00 N	3127 159		00
3120 201		0000	3127 229		0000
3120 346		1	3127 359	Fe?, Co	0
3120 481	-,Cl	3	3127 474		0
3120 539	Fe	2	3127 604		0
3120 711		000	3127 784		2 d?
3120 841	Zr	0	3127 959		1
3120 986	Fe?	1	3128 199		0 N
3121 191		0000	3128 402		1
3121 270 s	V	4	3128 499		0
3121 529	Co	1	3128 634		0
3121 714	Co,	3	3128 819	Cl,	2
3121 893		1	3128 889		00
3121 969		00	3129 010	Fe?	1
3122 079		00	3129 120	Co	000
3122 192		0	3129 220	Fe?	1
3122 329		0	3129 290	Zi	0
3122 427	Fe?	1	3129 433	Fe, Ni	3
3122 680		2	3129 645	Co,	00 N
3122 774		00	3129 880 s	Zi	0
3122 894		0000	3130 060		00 N
3123 019		0	3130 250		00 N
3123 059		00	3130 380	V	3
3123 203	li	0	3130 529		1
3123 371		00	3130 681		1
3123 460	Fe?	0	3130 745	Be?	0
3123 554		00	3130 909	Ti,-	3
3123 672		1	3131 169	Be?	1 N
3123 809		0000	3131 350	Cr,-	0
3123 889	li?	00 N	3131 475		0
3124 070		1	3131 560		0
3124 208	Fe?	0	3131 640		0
3124 394		000 N	3131 822		0
3124 599		00	3131 920		000
3124 749		00	3132 065		000
3124 799		000	3132 169	,Cr	4
3124 914		00	3132 303	,Co	0
3125 029		2	3132 402	Mn?	0
3125 109	Cr,	4	3132 635	Fe?	2
3125 164		2	3132 749	Mo	1
3125 399		5	3132 935	Cl,	00 N
3125 579	Cr?	00	3133 180		1
3125 779	Fe, V	5	3133 330	Cd, Zr	1
3126 029	Zr	0	3133 449	V	2

# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS XV

By HENRY A. ROWLAND

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3133 605	Zr	0	3138 901		0
3133 790		000 N	3139 031		0
3134 080		00 Nd?	3139 221		000
3134 230 s	Ni, Fe	8	3139 279		2
3134 451		1	3139 421		0
3134 510		1	3139 601		00
3134 655		000	3139 781		1
3134 740		00	3139 876		1
3134 830		00	3140 052	Fe?, Co	5
3135 051	V,	2	3140 131		0000
3135 160		000	3140 324		0
3135 295		000	3140 503	Fe?	2
3135 470	Fe?	1	3140 626		000
3135 567	Fe?	1	3140 872 s	Co,-	3
3135 703		0	3141 053		000 N
3135 821	Fe?	2	3141 221		00
3135 985	Fe?	1	3141 296		0
3136 130		00	3141 411		00
3136 200		000	3141 628	,Li?	0
3136 310		0	3141 781	Ti?	00
3136 460		00	3141 916		0000
3136 621	Fe?	2	3142 023		2
3136 705		0	3142 136		000
3136 822	Cr, Co	3	3142 271		000
3137 005		1	3142 339		0
3137 140	Zr	0	3142 585	Fe, Cu?	5
3137 215		000	3142 626		000
3137 445 s	Co	3	3142 791		000
3137 560	Co	000	3142 846	Mn	00
3137 675		00	3143 012	Fe	2
3137 825		00	3143 131		1
3137 880	Co	0	3143 271		00
3138 011		00	3143 357	Fe?	1
3138 120		00	3143 451		0000
3138 191		00	3143 601		2 N
3138 321	(1?)	000	3143 690		1 N
3138 421		0000	3143 879	I1	4
3138 521		000	3144 011		0
3138 633	Fe?	2	3144 111	Fe	2
3138 798	Zr	1	3144 231		0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3144 351		0	3150 947	Co?	0000
3144 441		0	3151 120		1
3144 568		1	3151 212		0000
3144 616	Fe?	1	3151 352		1 N
3144 744		0	3151 467	Fe	2
3144 852	Ti?	1	3151 632		0000
3144 931		000	3151 757		000
3145 040		0	3151 978	Fe?	1
3145 206	Co, Fe	3	3152 115		1
3145 251		2	3152 232		0
3145 484		3	3152 377	Li,	5
3145 641		0	3152 572		00
3145 840	Ni,	2	3152 712		0000
3145 906		1	3152 852	Co,-	1 Nd?
3146 091	Zr	1	3152 972	Ci?	000
3146 221		000	3153 072		0
3146 371		1	3153 173		00
3146 416		0	3153 306	Fe	3
3146 581		0	3153 434	Fe?	1
3146 713		1	3153 683	Ci,-	00 Nd?
3146 871		0	3153 866 s	Fe?	1
3147 049		1	3153 985		0000
3147 183	Co	2	3154 120		00
3147 350	Cr	3	3154 235		00
3147 382	Ti?, Fe?	2	3154 315	Fe, Ti	3
3147 562		1	3154 535		1
3147 714	Fe?	1	3154 608	-,Fe	1
3147 899	-,Fe?	1	3154 710		0
3148 157	Li	2	3154 758	-,Co	0
3148 283	Mn	1	3154 903	-,Co	1
3148 422		00	3155 055		000 N
3148 555	Fe, Cr	3	3155 245	-,Cr	1
3148 757		0000 N	3155 405	Fe	1
3148 912		0 N	3155 520		00
3149 015		0	3155 737		0
3149 237		000 N	3155 773	Ti	3
3149 432	Co	1	3155 910	V	0
3149 512		000	3156 020		0
3149 612		00	3156 055		0
3149 757		0000	3156 205		0000
3149 839		0	3156 305		0000
3149 967		2	3156 387	Fe	2
3150 013		1	3156 565	Fe?	1
3150 192		1	3156 680		0
3150 344		0	3156 842		00
3150 422	Fe	1	3156 960		0
3150 532		00	3157 030		0
3150 627		000	3157 145	Fe	2
3150 767	Co?	0000	3157 257	Co, Fe?	1
3150 862		1	3157 408		0



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3157 525	Ti?	1	3163 336		0
3157 615		1 N	3163 536		2
3157 748		00	3163 671		0000
3157 865		0	3163 796	Cr	0000
3157 996	Fe	1	3163 881		0
3158 110	Fe?	0	3164 001	Fe	1
3158 163		0	3164 043		1
3158 305		00	3164 161		0
3158 465		0	3164 286	Cr	00
3158 517		1	3164 408	Fe?	1
3158 635		0	3164 531		0
3158 747		0	3164 661		0
3158 897	Co	1	3164 798		1
3159 000	Ca	2	3164 946		1
3159 125	Fe?	0	3165 011		000
3159 225		0	3165 117	Fe	1
3159 375		0	3165 196		000
3159 463		0	3165 269		1
3159 550		00	3165 378		0
3159 645		1	3165 532	Zr	00
3159 785	Co	0	3165 624		1
3159 945		00 N	3165 787		000 N
3160 049		0 N	3165 987	Fe	1
3160 196		00	3166 070	,Zi	2
3160 327	Fe?	2	3166 242		0
3160 461	Fe	1	3166 367	11	1
3160 586		0000	3166 447		0
3160 726	Cr?	00	3166 550	Fe	1
3160 761	Fe	2	3166 707		0
3160 915		1	3166 786		1
3161 036		0	3166 879		0
3161 146	Mn	0	3166 977		000
3161 317	Ti	3	3167 097		00
3161 495	Fe	1	3167 289 s	Mn	1
3161 536		0	3167 407		0000
3161 666		00	3167 527		000 N
3161 766	Co	000	3167 707		00 N
3161 887	11	3	3167 902		1
3162 014		0	3167 971		3
3162 065	Fe	3	3168 022	Fe?	2
3162 236		0000	3168 157		0000
3162 291		0000	3168 263		2
3162 466	Fe?	1	3168 392		0000
3162 546		00	3168 547		000
3162 683	Ti	4	3168 640	Ti	4
3162 816		000	3168 784		0
3162 916		0	3168 968	Fe	1
3163 036		0000	3169 067	Fe?	1
3163 141		0000	3169 187	Co?	000
3163 208		1	3169 304	Co?	0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3169 478	Co	1	3175 931	La?, Fe?	0000
3169 539		1	3176 099 s		1
3169 727		0	3176 211		0000
3169 864		1	3176 410	Fe?	1 } d
3169 972		0	3176 462		1 }
3170 117		0000	3176 556		00
3170 239		00	3176 711	Fe?	0000
3170 367		0000	3176 786		0000
3170 455	Fe, Mo	2	3176 946		000
3170 592		00	3177 041	Fe?	0000
3170 822		1	3177 191		00
3170 917	Fe	0000	3177 413	Co	2
3171 096		0	3177 633	Fe?	2
3171 252		000	3177 791	Fe	1
3171 327		0000	3177 933		00 Nd?
3171 466		2	3178 132		2
3171 577	Fe?	0000	3178 272	Mn, Fe?	1
3171 776		1	3178 437		0000
3171 882		00	3178 542		00
3172 047	Fe?	000	3178 620	Fe?	1 Nd?
3172 162 } s		3	3178 752		0000
3172 198 }		4	3178 897		000 d
3172 408		0	3179 077	Fe	0
3172 488		0000	3179 172		00
3172 618		0	3179 277	Cr?, Cr?, Ca	000 N
3172 758		000	3179 453		5 d?
3172 833	Li?	0000	3179 624		1 N
3172 963		000	3179 782	Fe, Co	000 N
3173 108		1	3180 012		0
3173 321	Fe?	0	3180 077		00
3173 519		1	3180 232	Ca	00 N
3173 661		00	3180 347		3
3173 716	Fe?	1	3180 602		0
3173 794		1	3180 821	Fe	2
3173 951		000	3180 857		2
3174 061	Co?	000	3180 992		000
3174 166		00	3181 162	,Ca ,Cr?	000
3174 266		0	3181 162		0000
3174 332		0	3181 242		0000
3174 491		0	3181 312	Fe	3
3174 601		1	3181 387		0
3174 808		2	3181 531		1
3174 896		0000	3181 642	Ni	00
3175 064	Co	1	3181 752		0
3175 156		0	3181 856		1
3175 276	Cd?, Fe	0000	3181 975	Zr	1
3175 425		1	3182 022		1
3175 562		2	3182 172	,Fe Co	1
3175 666	Fe	0000	3182 232		00
3175 821		0000	3182 357		0
			3182 427		0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3182 582		2	3188 656	,Fe	6d?
3182 762		0 N	3188 934	Fe	2
3182 918	Zr	0	3189 046		000
3182 961		1	3189 196		0000
3183 101	Fe, Ni?	3	3189 281		0000
3183 235	Fe?	2	3189 429		0
3183 372	Ni?	0	3189 606		00 N
3183 428	Cr?	00	3189 746		0000
3183 533	V	1	3189 876		00
3183 631		000	3189 936	Co	000
3183 692		0	3190 076		000
3183 873		0000 N	3190 154	Fe?	1 } d
3184 075		2	3190 216		1 }
3184 109	V	2	3190 276		000
3184 225	Ti	1	3190 406		000
3184 321		0	3190 516		000
3184 490	,Ni	2	3190 651		000
3184 553		000	3190 795	V	2
3184 658		00	3190 961	Fe?	2
3184 726	-,Fe?	1	3191 011	Ti	3
3184 873		0000	3191 236	Fe?	0
3185 006	Fe	2	3191 306		00
3185 133		1 N	3191 426	Co	000
3185 203		0000	3191 526		0
3185 333		0000 N	3191 676		0000
3185 438		2	3191 776	Fe	2
3185 499	V	2	3191 911		00
3185 675		00	3192 001		00
3185 785		0	3192 120	Ii	2
3185 915		000 N	3192 151		00
3186 090	Co,-	0	3192 306		00
3186 215		0 Nd?	3192 386	Co?	0
3186 383		00	3192 508	Fe?	0
3186 494	Co	0	3192 646		00
3186 564	Ti	1	3192 729		00
3186 745		0000	3192 836		000
3186 863	Fe	3	3192 936	Fe	2
3186 905		1	3193 029	Fe?	1 N
3187 075		00	3193 166		00
3187 175		0000	3193 346	Co, Fe	3
3187 279		0	3193 413	Fe	2
3187 419		1	3193 661		000 N
3187 667		0 Nd?	3193 846		00 N
3187 824	V	2	3193 928	Fe?	1 N
3188 010		0000	3194 091	Mo	000
3188 145 } s	Cr?	1	3194 206	Cu	0
3188 170 }	Fe?	1	3194 346		00
3188 310		0000	3194 451		0000
3188 446		0	3194 543	Fe	1
3188 487	Co	0	3194 636		00

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3194 698		I	3201 494		000
3194 876		000	3201 624		00
3194 961		0	3201 724	Γ <sub>1</sub>	00
3195 085		00	3201 834		000 N
3195 197		0	3202 004		000
3195 252		00	3202 069		000
3195 342		00	3202 253	N <sub>1</sub>	I
3195 517		000 N	3202 369		00
3195 705 s	N <sub>1</sub>	2	3202 494	V	0
3195 837	Γ <sub>1</sub> ?	I	3202 651	Γ <sub>1</sub> , Fe	2
3195 987		0000	3202 779		0
3196 102		0	3202 807		0
3196 218	Fe?	3	3202 934		0
3196 307	Fe?	00	3203 054		0
3196 452		000	3203 144	Co	000
3196 577		000	3203 274		0000 N
3196 682		00	3203 435		I
3196 737		00	3203 552	I <sub>1</sub> ,	2
3196 947		0000	3203 624		000
3197 037	Fe	I	3203 724		0000
3197 085	Fe	2	3203 824		0000
3197 222	Cr, N <sub>1</sub>	3	3203 944	I <sub>1</sub>	I
3197 318		000	3204 092		I
3197 473		0000	3204 225		0000
3197 653	I <sub>1</sub> , Fe?	I	3204 396		2 Nd?
3197 708		00	3204 565		00
3197 822		I N	3204 685		0000
3197 983		0000	3204 805		0000
3198 133	V	0	3204 975	Γ <sub>1</sub> ?	0
3198 213	Li?	000	3205 065		000
3198 388		0	3205 225		00
3198 599		I	3205 335		0
3198 799	,Co	00 Nd	3205 445		00
3199 014	Fe?	000 N	3205 520	Fe	2
3199 249		0	3205 685	V	00
3199 349		0000	3205 765		000
3199 454	,Co?	0	3205 895		00
3199 639	Fe	4	3205 950	Γ <sub>1</sub> ?	000
3199 774		00	3206 119		I
3199 934		0000 N	3206 225		0000
3200 034 s	T <sub>1</sub>	2	3206 350		0
3200 249		00	3206 460	Γ <sub>1</sub> ?	000
3200 407		2 Nd?	3206 605		00
3200 581	N <sub>1</sub> , Fe	5 Nd?	3206 645		00
3200 734		000	3206 875	, I <sub>1</sub> ?	0 Nd?
3200 903	Fe?	2	3207 055	Mn?, -	I
3201 074		I	3207 193	-, Fe?	I
3201 126		I	3207 290		00
3201 239	Fe?	0000	3207 360		00
3201 374		00	3207 525	V	0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3207 675		00	3213 677		000
3207 788		1	3213 807		00
3207 823		0	3213 857		0
3208 005	Ti <sup>2</sup>	000	3214 042		000
3208 101		0	3214 143	Fe	2
3208 206		0	3214 185	Fe, Ni	2
3208 326	Cu	0000	3214 335	,Ti	1 N
3208 464	V	1	3214 515	Fe	2
3208 586	Fe	1	3214 607		000
3208 707	Cr <sup>2</sup>	1	3214 727		00
3208 801		0	3214 889	Ti,	3
3208 906		000	3214 977		000
3209 006		00	3215 142		000 N
3209 116	Ti <sup>2</sup>	0000	3215 292		1
3209 229		00	3215 317		1
3209 297	Cr,	1	3215 467	Co?	0
3209 411	Fe	1	3215 517		1
3209 546		00	3215 707		000
3209 601		000	3215 757		000
3209 736		000	3215 827		0000
3209 786		000	3215 957		1
3209 876		0000	3216 061	Fe	2
3210 046	,Ni	1 N	3216 162		000
3210 158		0	3216 327		0
3210 337	Fe, Co	3	3216 472		000 N
3210 564		2	3216 659		0
3210 592	Fe?	1	3216 807		1
3210 751		0	3216 928	,Ni	0
3210 836		00	3217 040	Mn, li?	1 N
3210 948	Fe	2	3217 183	li	2
3211 056	Co <sup>2</sup> ,	000	3217 210		1
3211 176		000	3217 413		000
3211 281		00	3217 505	Fe, Cr	2
3211 321		00	3217 658		0000 N
3211 421	Cr?	000	3217 838		0000
3211 602	Fe?	1	3217 954	Ni	1
3211 746		1	3218 048	li	000
3211 796	Fe?	1	3218 188		00
3211 996	Fe?	1	3218 318		0000
3212 117	Fe	2	3218 389 s	Ti	2
3212 277		1	3218 563		000
3212 435		0	3218 728		00
3212 552		00	3218 798	Cr?	00
3212 657		1	3218 978		0000
3212 802		00	3219 098	Co?	000
3213 004	Mn,	2 N	3219 260		1
3213 247	Ti	1	3219 313	Co, Ti	00
3213 423	Fe	3	3219 483		000 N
3213 517		00	3219 543		0000
3213 587		00	3219 711 s	Fe, Cl	2

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3219 919 s	Fe	3	3226 266	Ti	0
3220 079		0000 N	3226 342		0000
3220 259		0000Nd?	3226 462		0000
3220 426		0	3226 562		00
3220 547		0	3226 657	Cr?	00
3220 664		00	3226 854	Fe?	1 } d
3220 721		00	3226 880	-, li	2 }
3220 889		000	3227 007		00
3220 949		000	3227 123	Ni	1
3221 084		0000 N	3227 175	Fe?	1
3221 249		000	3227 292		0000
3221 388	Ni	1	3227 392	Cl?	0000
3221 499	li	00	3227 542		0000
3221 659		000	3227 612		0000
3221 773	, Ni	2	3227 747		0000
3221 874		0000	3227 877	Fe	2 } d
3222 002		0	3227 925	Fe	2 }
3222 034	Fe?	1	3228 112		0
3222 201 s	Fe	3	3228 219	Mn	1
3222 374		000 N	3228 370	Fe	1
3222 559		000 N	3228 503		000
3222 699		000 N	3228 618		00
3222 844	Ti?	000 N	3228 735	Ti?	2
3222 970	li,	4	3228 953		0
3223 059		000	3229 016	Fe?	0
3223 214		000	3229 263	Fe	2 } d
3223 378		1	3229 324	li, Cr	3 }
3223 479		00	3229 468		0000
3223 564		00	3229 542	Ti	2
3223 631	li	0	3229 704		1
3223 754		000	3229 911	Fe?	0
3223 859		000	3229 999	li	0
3223 962		0	3230 106	, Fe	1
3224 154		0000 N	3230 213		0
3224 368 s	Ti,-	2	3230 323	Fe	1
3224 540		0000	3230 588		0 N
3224 600		0000 N	3230 708		00
3224 750	Co	00	3230 843	Mn,	1
3224 882	Mn	1	3230 962		00
3225 040		0	3231 123	Fe,	2
3225 146	Ni	1	3231 193		0000
3225 237		0000	3231 338		0000
3225 382		00	3231 442 s	li	2
3225 487		000	3231 588		00
3225 577		00 N	3231 703		0
3225 732	Fe?	0	3231 823	Zr	1
3225 827		000	3231 958		0000
3225 919 s	Fe	3	3232 063		00
3226 024		0	3232 193		0000
3226 143	Mn	0	3232 273		00

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3232 407 s	I <sub>1</sub>	2	3239 170	I <sub>1</sub>	7
3232 509		0000	3239 435		0
3232 664		0000 N	3239 574	Fe	3
3232 804		000 N	3239 786	I <sub>1</sub>	2
3232 914	T <sub>1</sub>	00	3239 966		000
3233 055	N <sub>1</sub>	2	3240 137		0
3233 171	Fe	1	3240 239		00
3233 284	N <sub>1</sub> ?	00	3240 381		0000 N
3233 394	Cr?	00 N	3240 522	Mn	1
3233 554		0000 N	3240 616		0000
3233 654		000	3240 726	Mn	0
3233 786		00	3240 826		1
3233 879		00	3240 991		0000
3234 093	Fe	2	3241 081	C <sub>1</sub>	000
3234 189	Zr,	0 N	3241 168	Z <sub>1</sub>	1
3234 394		000 N	3241 256		0000
3234 469		000 N	3241 366		0000
3234 635	T <sub>1</sub>	3	3241 509		0
3234 764	Fe, N <sub>1</sub>	3	3241 607		0
3234 894		0000 N	3241 721		0000
3235 049		0	3241 806		00
3235 144		00	3241 936		000 N
3235 304		00	3242 125	I <sub>1</sub> ,	8
3235 444		0	3242 226		0000 N
3235 674	Co	0	3242 395		1
3235 701	Fe?	0	3242 531		0000
3235 888	Zr	1	3242 607		0000
3235 913		0	3242 747		00
3236 050		0000	3242 827		00
3236 251	T <sub>1</sub>	1	3242 952		000
3236 349	Fe	2	3243 132		1
3236 540		00 N	3243 189	,N <sub>1</sub>	6
3236 703 s	T <sub>1</sub>	7 N	3243 332	Cu?	000
3236 905	Mn,	1	3243 532		1
3237 040		000	3243 682	I <sub>1</sub> ?, Co	000 N
3237 154	Co	1	3243 883	,Mn	2
3237 260		000	3243 978	Co	1
3237 350		0	3244 147		0000 N
3237 548		1 N	3244 257		0
3237 700		000	3244 317	C <sub>1</sub>	0
3237 840	Cr	00	3244 472	Fe	3
3237 967	V	2 Nd?	3244 617		0 N
3238 155		0	3244 667		00
3238 205	Cr	0	3244 822		00
3238 330	T <sub>1</sub>	000	3244 987		00 N
3238 435		00	3245 137		00
3238 635	Cr?	00	3245 257		00 N
3238 670		00	3245 397		00 N
3238 885		0	3245 517		000 N
3239 015		00 N	3245 662	C <sub>1</sub>	1
					0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3245 847		0000	3252 729	Ca	o N
3245 907		0000	3252 865	Cr	o N
3246 104	Fe	4	3253 012	Fe, Fe	5
3246 150		3	3253 090	Mn	4
3246 290		0000	3253 158		000
3246 429		000	3253 274		000
3246 613	Fe	2	3253 391		00 Nd?
3246 803		0000	3253 531		000
3246 889		0000	3253 684		0
3247 096	Co	4	3253 731	Fe	2
3247 311	Co	3	3253 841		0000
3247 420	Fe	1	3253 964	Fe	2 N
3247 525		0	3254 078		2
3247 688 s	Cu	10	3254 180	Mn	1 N
3247 908		0000 N	3254 314	Ti	3
3248 095		000 N	3254 381	Co	4
3248 248	Fe	1 N	3254 497	Fe	4
3248 339	Fe	3	3254 590		2
3248 442		0000	3254 881	V, Fe	5 d?
3248 589	Ni	2	3255 150		000
3248 637	Mn	o N	3255 283		0000
3248 731		1	3255 413		000
3248 841	Ti	2	3255 617	Mn	1 N
3248 987		0000 N	3255 800		000 N
3249 147		1	3255 937		0000
3249 313	Fe	2 N	3256 021	Fe?	6
3249 497	Ti	2	3256 102		0000
3249 577	Ni	2	3256 264	Mn	3
3249 654		00	3256 382		0000 N
3249 754		00	3256 616		1 N
3249 803		0	3256 830	Fe	2
3249 980		0	3257 081		0000 N
3250 046		000	3257 223		2
3250 136	Co	1	3257 355	Fe	4
3250 270		000 N	3257 481		00
3250 514	Fe, Zr?	3 N	3257 549		2
3250 756	Fe	3 N	3257 721	Fe	4
3250 886	Ni	4	3257 944	Cr	1
3251 060		0000 N	3258 028		0
3251 273	Mn	o N	3258 141		0
3251 375	Fe	3	3258 221	Co	0
3251 472		1 N	3258 408		0000
3251 659		0000	3258 542	Mn, Co	3
3251 732		000	3258 752		1 N
3251 805		0000	3258 904	Fe	3
3251 977	Fe	3	3259 034		0000 N
3252 057		4 d?	3259 183	Fe	3
3252 245		00	3259 357		0000 N
3252 359		0000 N	3259 494		0000 N
3252 560	Fe	4	3259 567		0000 N



# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS XVI

By HENRY A. ROWLAND

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3259 720		0	3265 454	Co	0 N
3259 834		0	3265 678		2
3259 977		0000 N	3265 762	Fe	4
3260 110	Cr, Fe	4	3265 822		00
3260 266		000	3266 016	V	1
3260 386 s	Mn, Ti Fe	5 d'	3266 102		000
3260 593		0000	3266 275		000
3260 673		00	3266 362		000
3260 813		000 N	3266 561		00 Nt?
3260 950	Co	1	3266 798		3 N
3261 079		0000 N	3267 072		1
3261 186		00 N d?	3267 184		1
3261 319		0000 N	3267 328		00
3261 460	Fe	2	3267 391		000
3261 705	li	3	3267 561		00
3261 760		4	3267 661		0000 N
3261 938		00	3267 834 s	V	6
3262 142	Fe	2	3267 910	Mn	0000
3262 409	Fe Sn	3	3268 186	Fe	1
3262 558		0000	3268 366		3
3262 838		0000 N	3268 468		0000
3263 023		3	3268 558		0000
3263 194		1	3268 644		00
3263 254		0000	3268 847	Mn	0000
3263 355	V, Co	0	3268 983		000
3263 491	Fe	4	3269 098		0
3263 587		0000	3269 207		000
3263 813	Ti	4	3269 355	Fe	1
3263 960		0 N	3269 462	Fe	00
3264 097		0	3269 555		0
3264 187		0	3269 627		0
3264 307		00 N	3269 747	Zi	0000 N
3264 405		1	3269 890		1
3264 528	Mo?	0	3270 033		000
3264 646	Fe	4	3270 089	Fe	2
3264 833	Mn	2	3270 265	,Co	1 N
3264 906	Co	2	3270 473	Mn	00
3264 983		00	3270 656		0000 N
3265 176	Fe,	3 d?	3270 794	Ti?	0
3265 310		0000	3270 872		0000 N

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3271 129	Fe	6	3278 221		000 N
3271 266	Ni, Co, Zr, V	5	3278 420	Li	5
3271 436		0000	3278 574		0000
3271 536		0000	3278 687	Mn	1
3271 621		1	3278 867	Fe	3
3271 791	Ti, Fe	6d?	3278 974		00
3271 918	Co	0	3279 060	Li	4
3272 085		0000 N	3279 279		1
3272 217	Li	5	3279 400	Li, Co	2
3272 367	Zr	2	3279 574		0000
3272 558		0000 Nd?	3279 644		0000
3272 729		1	3279 784		0
3272 855		0	3279 872	Fe	1
3272 971		0000 N	3279 973	V	1
3273 175	Mn Li	2	3280 120	Ti	2
3273 311		0000	3280 256		000 N
3273 477		000	3280 392	Fe	4
3273 606		1 N	3280 493		0000 N
3273 758		0	3280 623		0000 N
3273 844		0000	3280 806	Ag	0
3273 970		0000 N	3280 900	Mn	1
3274 096 s	Cu	10	3281 100		0000 Nd?
3274 350		1	3281 250		0 N
3274 575	Fe	3	3281 429	Fe	5
3274 677		0000	3281 652		0000
3274 800		0	3281 725		0000
3274 907		0000	3281 841		2
3275 033		1	3281 993	Ni	2 d'
3275 149		0000	3282 122		000
3275 276		0000	3282 372		00
3275 353		0000	3282 459	Li, Zn	5
3275 423	Ti	3	3282 572		0
3275 529		0000	3282 665	V	1
3275 603		0000	3282 830	Ni	2
3275 716		000	3282 962	Ni	2
3275 809		1	3283 029	Fe	2
3275 969		0 N	3283 179		000
3276 103		000	3283 286		00
3276 250	V	5 d'	3283 332		00
3276 386		00	3283 458	Co	0
3276 594	Co, Fe	3	3283 576	Co,-	2
3276 741		1	3283 680	Fe	1
3276 905	Li	3	3283 812		0000
3277 124	Li	2	3283 929		00 N
3277 225		0000	3284 059		00
3277 315		0	3284 116		00
3277 482	Co-Fe :	7 d?	3284 256		0000 N
3277 795	Co	0 N	3284 366		0000
3277 848		0 N	3284 489		0000
3277 997		0 N	3284 559	Ni	1

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3284 648		0	3290 375		00
3284 723	Fe	2	3290 475		0000
3284 847	Zr	1	3290 602		00
3284 968		0 00	3290 642		0 N
3285 148		0 N	3290 765		000
3285 324		1	3290 842	Fe	2
3285 421		0	3291 119	Fe	1
3285 547	Fe	2	3291 261		0 N
3285 678		00	3291 411		0900
3285 828		0000	3291 557		00
3285 908		0000	3291 671		000
3286 034	Fe <sup>2</sup> , Ti <sup>2</sup>	000 N	3291 824	Fe	00
3286 164		2	3291 897		1
3286 197		0	3292 151	Fe	1
3286 310		0000	3292 206	Fe, Co	1
3286 384		000	3292 337		0000 N
3286 494		0000	3292 451		0
3286 580		1	3292 636		0
3286 667		00	3292 728	Fe	4
3286 784		0	3292 870		0000 N
3286 898	Fe	7 N	3292 996	Mn <sup>2</sup>	000
3286 980		0 N	3293 053		00
3287 086	Ni	3	3293 276	Fe, Co	2
3287 224	Fe	2	3293 350		0000
3287 347	Co	2	3293 605		00
3287 460	Zr <sup>2</sup>	000	3293 800	Fe	1
3287 560		000	3293 900		00
3287 597		000	3293 989	Co <sup>2</sup>	000 N
3287 709		0000	3294 125		0000 N
3287 793 s	Ti	5	3294 235		0000 N
3287 863		0000	3294 325		000 N
3287 986		0000 N	3294 462		0000 N
3288 175		0	3294 569		0000 N
3288 281	Ti	3	3294 682		0000
3288 453	Fe	00 N	3294 749	Co	00
3288 561	Ti	2	3294 849		000
3288 705	Ti	2	3294 949		00 N
3288 801	Fe	1	3295 069	Li	0
3288 939	Zr	0	3295 149		0000
3289 103	Fe	2	3295 243		0
3289 153		0	3295 375		1
3289 272		0000	3295 562		2
3289 372		0000	3295 732		000
3289 498		4	3295 762		0000
3289 568	V	3	3295 951	Fe, Mn	6
3289 705		0000 N	3296 168	Mn <sup>2</sup>	00
3289 875		0000	3296 388		1 N
3289 988		000	3296 504	Li <sup>2</sup>	000 N
3290 035		000	3296 602	Fe	2
3290 238		0000 N	3296 721		0000 N

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3296 948		I	3302 895		0000
3297 014	Mn	I	3302 990		3
3297 194		o N	3303 109 s	Na	5
3297 301	Co	o	3303 248	I a	000 Nd?
3297 381		o	3303 398	Mn	oo N
3297 511		000	3303 601 } s		3
3297 644		000	3303 698 }	Fe	2
3297 720		000	3303 908		000
3297 793		000	3304 022		0000 N
3297 963		o N	3304 263		000
3298 009		I	3304 375	Mo?	I
3298 140		0000	3304 492		o
3298 268	Fe, V, Di	5	3304 577		000
3298 361	Mn	000	3304 611		000
3298 451		0000	3304 719		oo
3298 545		0000	3304 881		oo N
3298 685		I	3305 001	Mn	oo
3298 818	Co	2	3305 089	Ni	I
3298 869	V	3	3305 194		000
3298 995		0000	3305 283	Co Zr	2
3299 211		I	3305 354		000
3299 305		0000	3305 434		0000
3299 477		0000	3305 541		0000
3299 564	Ti	2	3305 604		0000
3299 652	Mn	o Nd?	3305 754		000 N
3299 804		o	3305 877	Co	o
3299 905		o	3305 991		2
3300 017		000	3306 105 s	Fe	4 N
3300 204		0000 N	3306 221		2 N
3300 297		oo N	3306 296		0000
3300 444		0000 Nd?	3306 412 } s	Zi	2
3300 617		000	3306 506 }	Fe	4
3300 687		0000 N	3306 623	Co	I
3300 802		000	3306 726		I
3300 944		0000	3306 830		000
3301 039		000	3306 903		0000
3301 143		0000 N	3307 010	Ii	oo
3301 263		0000 N	3307 114	Mn	I
3301 352	Fe	I	3307 165	Fe	2
3301 452	Fe	o	3307 280	Co	I
3301 706		0000	3307 374	Fe	I
3301 808	Ti, Sr	I	3307 473		0000
3301 909		0000	3307 636	Si?	000 N
3301 996		0000	3307 845	Fe	4
3302 055	Fe	o	3308 035		oo N
3302 232	Ii, Pd	4	3308 239		o N
3302 289		0000 N	3308 405		0000
3302 443		0000 N	3308 527	Ii	o
3302 510 s	Na	6	3308 619	Co	oo
3302 720	Zn	I	3308 749		000

\* A zinc line comes between these two



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3320 391	Ni	7	3326 335		00
3320 508		0000	3326 432		000
3320 621		0000	3326 553		0
3320 783		2	3326 727		0 N
3320 907	Mn, Fe	1	3326 825	Co	1
3321 044	Be?	0000	3326 907 <sup>†</sup>	Li	5
3321 177		0000 N	3326 998 <sup>†</sup>		3
3321 324		000	3327 127	Co	1
3321 366		0	3327 297		00
3321 494	Be?	0000	3327 424		0000
3321 550		000	3327 533	Ni	2
3321 667		00	3327 633	Fe	1
3321 715	Li	00	3327 757		000
3321 836	Li,	4	3327 861		0000 N
3322 047		000 N	3328 016	Dir	2
3322 190		0000	3328 101		0
3322 331	Co	1 Nd <sup>†</sup>	3328 341	Co	00
3322 454	Ni	3	3328 487		2
3322 610	Fe	2	3328 605		0
3322 764		00	3328 713		0000
3322 833		00	3328 840	Ni	1
3323 003		1	3328 933		0000
3323 050 <sup>†</sup>	Li	5	3329 000	Fe	3
3323 116 <sup>†</sup>		3	3329 186	Li, Fe	1
3323 213		1	3329 233		000
3323 250		00	3329 338		0000
3323 426		0000	3329 435		0000 N
3323 524		1	3329 568 <sup>†</sup>	Li, Co	5
3323 660		0	3329 648 <sup>†</sup>		3
3323 881	Li	3	3329 762		0000 N
3324 040		000	3329 902	Fe	00
3324 120		0	3329 982		000
3324 201		4 N	3330 044	Mg	3
3324 280		0	3330 102		2
3324 491	Fe	1	3330 212	Si?	000
3324 674	Fe	3	3330 364		0
3324 805		0	3330 436		1
3324 921		1	3330 565		0000 N
3325 142		0	3330 645		000
3325 168		0000	3330 745	Sn?	000
3325 288		0000	3330 802	Mn	00
3325 381	Co	1	3330 914		000
3325 462		000	3331 056		1 N
3325 600		3	3331 194		000 N
3325 712	Fe	000	3331 384		00 N
3325 820		0000	3331 527		000
3325 886		0000	3331 747 <sup>†</sup>	Fe	2
3326 028		000	3331 915	Fe	2
3326 105		0000	3332 061		000 N
3326 212		0000	3332 181		0

<sup>†</sup> See note to 3335 192, 3335 350, etc

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character	
3332 240	Mg	3	3338 054 <sup>†</sup>		0	
3332 326		3	3338 141		0000	
3332 421		000 N	3338 247		0	
3332 481		00	3338 368		000	
3332 707		0000 N	3338 478		000	
3332 850		0000	3338 561		000	
3332 965		0	3338 651	Co	00	
3333 026		0000	3338 750	Fe	2	
3333 160		000	3338 905		0	
3333 250		0	3338 944		0000	
3333 353	Co	000 N	3339 051		0000 N	
3333 526		2	3339 180	Ni <sup>2</sup>	1	
3333 726		1	3339 333	Fe	2	
3333 854		0	3339 438		000 N	
3333 953		000	3339 577		000 N	
3334 046		000	3339 713	Fe	1	
3334 116		000	3339 816		1	
3334 266		Co	4	3339 932	Co, Cu	3
3334 356		Fe	1	3240 011		1
3334 406		Zn <sup>2</sup>	1	3340 173		000 N
3334 613	Zn	0	3340 310		0000 N	
3334 753		0	3340 464 <sup>†</sup>	I <sub>1</sub>	3	
3334 846		0	3340 523 <sup>†</sup>		2	
3334 933		0000 N	3340 702	Fe	2	
3335 065		000 N	3340 823		00 N	
3335 192		0000 N	3340 957		0000 N	
3335 299 <sup>†</sup>		I <sub>1</sub>	3341 027		1	
3335 350 <sup>†</sup>		2	3341 137		0000	
3335 439		1	3341 300		0000 N	
3335 553		1 N	3341 417		0000	
3335 666	Fe	2 Nd <sup>2</sup>	3341 480	Co	00	
3335 859		1	3341 563		0000	
3335 915		2	3341 690		0000	
3335 979		000	3341 820		000	
3336 054		0	3341 967 <sup>†</sup>	I <sub>1</sub>	4	
3336 259		0	3342 062 <sup>†</sup>	I <sub>1</sub>	4	
3336 391		Fe	2	3342 280		0
3336 477		Cu	2	3342 358	Fe, I <sub>1</sub>	3
3336 635		Mg	00 N	3342 442	I <sub>1</sub>	3
3336 679			00	3342 506		0000
3336 820	8 N		3342 606		0000	
3336 962	0 N		3342 717	Cu	3	
3337 098	0		3342 829	I <sub>1</sub>	00	
3337 138	1		3342 892	Co	00	
3337 319	1 N		3343 032		00	
3337 471	0000		3343 156		00	
3337 524	000		3343 361		0	
3337 630	I <sub>2</sub>		0	3343 479		00
3337 803	Fe	3	3343 656		000 N	
3337 984 <sup>†</sup>	I <sub>1</sub>	2	3343 804	Mn	1	

<sup>†</sup> There are several cases like this where there is a close double, one line at least belonging to I<sub>1</sub>. It is not certain in such cases that both are not I<sub>1</sub> lines. Possibly the second may be I<sub>1</sub> and not the first. The notes do not yet settle these cases, except 3314 573 and 3314 663, when both lines belong to I<sub>1</sub>.

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3343 908	I <sub>1</sub>	4	3349 965		0000
3344 030		0000 N	3350 080		000 N
3344 215		000 N	3350 211		000 N
3344 315		00	3350 347		2
3344 521	I <sub>1</sub>	0000 N	3350 420		1
3344 655		2	3350 512		1
3344 721		0000	3350 545	D <sub>1</sub> <sup>2</sup> I <sub>1</sub>	1
3344 831		0000 N	3350 648		2
3344 924	Z <sub>1</sub>	0	3350 985		000
3345 015		000	3351 080		000
3345 068	Z <sub>n</sub>	2	3351 201		00
3345 156		2	3351 280		0000
3345 298	Mn	0000 N	3351 370		0000
3345 495		00	3351 472		0000
3345 618	Z <sub>n</sub>	000	3351 551		0000
3345 715		1	3351 658	Co I c	2
3345 761		00	3351 745		0
3345 835		00	3351 884		1
3345 955	C <sub>1</sub> / n	000 N	3352 101		0
3346 047		000 N	3352 198	I <sub>1</sub>	2
3346 151		0 N	3352 318		0000 N
3346 284		00	3352 578		000 N
3346 414	C <sub>1</sub>	00	3352 771		00 N
3346 557		0	3352 908		000
3346 731		0000 N	3352 958		000
3346 800 <sup>1</sup>		1	3353 065	I <sub>1</sub> , Fe	000
3346 904 <sup>1</sup>	I <sub>1</sub>	2	3353 262		1
3347 066	Co	2	3353 402	I c	2
3347 157		0000	3353 538		1
3347 267		0000 N	3353 661	Z <sub>1</sub>	000 N
3347 450		000	3353 768		0000 N
3347 507	C <sub>1</sub>	000	3353 875		00 N
3347 638		0	3354 057		4
3347 760		00 N	3354 191	I c	000 N
3347 970 <sup>1</sup>		3	3354 350		2
3348 072 <sup>1</sup>	Fe	3	3354 523	Co, Z <sub>1</sub>	00 N
3348 254	Co	1	3354 670		3
3348 370		0000 N	3354 778	I <sub>1</sub>	00
3348 520		0000 N	3355 023		3
3348 673		000	3355 197	Fe	00 N
3348 820		000	3355 363		0000 N
3349 043	I <sub>1</sub> , C <sub>1</sub>	4	3355 497	Mn	4
3349 135		3	3355 661		0000 N
3349 212		2	3355 797		0
3349 399		00	3355 957		0000 N
3349 519	Cr	2	3356 080		000 N
3349 597		7	3356 231	Z <sub>1</sub>	000
3349 695		00	3356 370		1
3349 785		00	3356 462		000 Nd <sup>2</sup>
3349 874		0	3356 548	Fe	2

<sup>1</sup> See note to 3335 299, etc.



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3356 676	Co	000 N	3362 402		2 d <sup>p</sup>
3356 821	Fe	2	3362 528		0
3356 976		000	3362 727		0000
3357 092		0000	3362 782		1
3357 256		000 N	3362 936	Co	4 Nd <sup>p</sup>
3357 412	Zr	2	3363 107		0
3357 537		1	3363 298		0000 N
3357 703		0	3363 442	Co	0 d <sup>p</sup>
3357 816		0000	3363 542		1
3357 874		0	3363 750	Ni	1
3357 959		00	3363 854		1
3358 076		0000	3363 955	Co	0
3358 182		1 N	3364 055		0
3358 276		0000	3364 148		00
3358 416	Li	3	3364 232		0000
3358 542		00	3364 302		00
3358 649	Ti, Cu	4	3364 408	Co	1
3358 771		00	3364 535		0 Nd <sup>p</sup>
3358 832		0	3364 719	Ni,	3 d <sup>p</sup>
3358 929		00	3364 832		00
3359 035		2 N	3365 081		0000
3359 144		00	3365 167		0000
3359 248	Ni	3 N	3365 247		0000
3359 420	Co	1	3365 341		00
3359 542		1	3365 451		0000 N
3359 636	Fe <sup>p</sup>	2	3365 581		0
3359 769		1	3365 684		00
3359 823		2	3365 908	Ni	6
3359 936		1 N	3366 127		000
3360 066		0	3366 311	Li, Ni	6 d <sup>p</sup>
3360 181		2	3366 491		000
3360 258		0	3366 594		000
3360 345		0	3366 687		0000
3360 444	Ni	2	3366 791		0000 N
3360 485	Cu	1	3366 931	Ni, Li	3
3360 631		0	3367 009	Fe	3
3360 741		0	3367 117		000
3360 828		0	3367 233	Co	2
3360 988		0	3367 207	Fe <sup>p</sup>	1
3361 055	Ti	1	3367 434		00
3361 141		0	3367 527		0000
3361 241		1	3367 575		0
3361 327	Li	8	3367 687		0
3361 421		2	3367 812		0
3361 568		0 N	3367 953		000
3361 704	Co,	3 Nd <sup>p</sup>	3368 029	Li, Ni, Fe	2
3361 906		1	3368 193	Cu,	5 d <sup>p</sup>
3361 988		0	3368 319	Mn	1
3362 087	Ti	2	3368 382		000
3362 275		1	3368 496		000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3368 580		0000	3374 271		000
3368 680		00	3374 358	Ni	4
3368 793		00	3374 487	Li, Co	2
3368 860		00	3374 588	Fe	1
3368 956		0	3374 778	Ni	2
3369 083		3 d?	3374 872	/i	1
3369 190		0	3374 981		000
3369 286		0	3375 068		0
3369 352	Li, Mn	1	3375 231		00
3369 506		0 N	3375 351		0000
3369 633		0	3375 478		0 N
3369 713	Fe, Ni	6	3375 601		0000
3369 800		1	3375 696	Ni	1
3369 932		0	3375 768		000
3370 052		0	3375 866		0
3370 173		00	3375 991		0000
3370 330		0 N	3376 081		0000
3370 468	Co	2	3376 164		00
3370 584	Li	2	3376 238		000
3370 770	Zr, Mn	1 Nd'	3376 341		0000
3370 933	Fe	4	3376 414		0
3371 020		000	3376 471	La	2
3371 110		0	3376 630	Fe	2
3371 246		00	3376 731		0000
3371 296		00	3376 811		0000
3371 431		0	3376 894		000
3371 535		00	3376 978		000
3371 593	Li	3	3377 081		0000
3371 745		000	3377 202	Co	0 N
3371 852		00	3377 108		00
3371 899		00	3377 197		0000
3372 124	Ni, Fe	4	3377 622	Li	3
3372 225		1	3377 723	Li	3
3372 314		0	3377 837		0000 N
3372 362	Li	2	3377 913		0000 N
3372 488	Fe	0	3378 114		1
3372 609	Fe	00 N	3378 203		000
3372 759		0 N	3378 320		00
3372 901		{ 5	3378 476	Li, Co?	2
3372 994	Li Pd	{ 5	3378 723		00
3373 105		0 N	3378 824	Fe	2
3373 229		000	3378 881	Co	1
3373 369	Co	0	3379 005	Mn	0 N
3373 452		0	3379 161	Fe	2
3373 555	/i	0	3379 337	Th, Cl	2 d?
3373 642		0	3379 514	Cl	2
3373 742		0000	3379 577		000
3373 872		0000	3379 687		0000
3374 016	Fe	1	3379 783		0000
3374 119		2	3379 843		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3368 580		0000	3374 271		000
3368 680		00	3374 358		4
3368 793		00	3374 487	Ni	2
3368 860		00	3374 588	I, Co	2
3368 956		0	3374 778	Fe	1
3369 083		3 d <sup>2</sup>	3374 872	Ni	2
3369 190		0	3374 981	Zr	1
3369 286		0	3375 068		000
3369 352	I, Mn	1	3375 231		0
3369 506		0 N	3375 351		00
3369 633		0	3375 478		0000
3369 713	Fe, Ni	6	3375 601		0 N
3369 800		1	3375 698	Ni	0000
3369 932		0	3375 768		1
3370 052		0	3375 866		000
3370 173		00	3375 991		0
3370 330		0 N	3376 081		0000
3370 468	Co	2	3376 164		0000
3370 584	I	2	3376 238		00
3370 770	Zr, Mn	1 Nd <sup>2</sup>	3376 341		000
3370 933	Fe	4	3376 414		0000
3371 020		000	3376 471	I	0
3371 110		0	3376 630	Fe	2
3371 246		00	3376 731		0000
3371 296		00	3376 814		0000
3371 431		0	3376 894		000
3371 535		00	3376 978		000
3371 593	I	3	3377 084		0000
3371 745		000	3377 202	Co	0 N
3371 852		00	3377 408		00
3371 899		00	3377 497		0000
3372 124	Ni,	4	3377 622	Ti	3
3372 225	Fe	1	3377 723	I	3
3372 314		0	3377 837		0000 N
3372 362	I	2	3377 943		0000 N
3372 488	Fe	0	3378 114		1
3372 609	Fe	00 N	3378 203		000
3372 759		0 N	3378 320		00
3372 901	Ti Pd	{ 5	3378 476	Ci, Co?	2
3372 994		{ 5	3378 723		00
3373 105		0 N	3378 824	Fe	2
3373 229		000	3378 881	Co	1
3373 369	Co	0	3379 005	Mn	0 N
3373 452		0	3379 161	Fe	2
3373 555	Zi	0	3379 337	I, Ci	2 d <sup>2</sup>
3373 642		0	3379 514	Ci	2
3373 742		0000	3379 577		000
3373 872		0000	3379 687		0000
3374 016	Fe	1	3379 783		0000
3374 119		2	3379 843		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3379 961	Cr	3	3385 577	Fe	1
3380 060	Zr, I <sub>1</sub>	1	3385 688	Fe	1
3380 157		0000	3385 809	I <sub>1</sub>	1
3380 255	Fe	3	3385 861	Fe?	00
3380 397 <sup>*</sup>	I <sub>1</sub>	3	3386 005		0000 N
3380 450 <sup>*</sup>		3	3386 085	I <sub>1</sub> , Mn	3
3380 605		0	3386 310		00 N
3380 722	Ni	6 N	3386 408		000
3380 889	Si?	1	3386 488		000
3381 026	Ni, I a	5 Nd?	3386 588		000
3381 202		0000	3386 691		00 N
3381 269		1	3386 875		000
3381 490	Fe	2	3386 921		000
3381 632		000	3387 014		000
3381 669		000	3387 194		000 N
3381 786		0000	3387 307		000
3381 896		000	3387 444		0
3382 002		000	3387 554	Fe	2
3382 129	Mn	0	3387 600		0
3382 224		00 N	3387 762	Fe	1
3382 340		0	3387 854		00
3382 450	I <sub>1</sub>	1	3387 988	I <sub>1</sub> / <sub>1</sub>	5 d?
3382 549	Fe	2	3388 190		0000
3382 604	Di?	1	3388 311	Co	3
3382 724		000	3388 473	/ <sub>1</sub>	1
3382 825	Cr, Mn	4	3388 604		0 N
3382 926		0000	3388 761	I a?	1
3383 036		00	3388 896	I <sub>1</sub>	2
3383 129		0	3388 994		00
3383 232		0000 N	3389 107		1
3383 342		0000 N	3389 257		000
3383 449	Ag	000	3389 387		00
3383 512		0	3389 460		00
3383 629		000 N	3389 540		0
3383 709		0	3389 747		0000 N
3383 833	Fe	3	3389 884 <sup>*</sup>	Fe	2
3383 951	I <sub>1</sub>	3	3389 960		0000
3384 133	Fe	3	3390 060		0000
3384 225		00	3390 154		000
3384 375		000	3390 244		000 Nd?
3384 461		000	3390 400		00
3384 561		000	3390 544		00
3384 728		0000 N	3390 654		000
3384 782		00	3390 736		000
3384 908		1	3390 819	I <sub>1</sub>	0
3385 061		0000	3390 919		00
3385 167		0	3391 033		00 N
3385 215		000	3391 175	Ni	5
3385 361	Co	3	3391 243		1 N
3385 468		0000	3391 409		0000 N

<sup>\*</sup> See note to 3335 299, etc

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3391 509	Cr	0000 N	3397 451	V?	0000
3391 578		2	3397 571		00
3391 726		0	3397 691		1
3391 806		0000 N	3397 779		2
3391 977	Zn	0	3397 931	Fe	00
3392 109		2	3397 974		000
3392 153	Fe	1	3398 151		0000 N
3392 259		0	3398 244		0000 N
3392 441	Cu	3	3398 357	Fe	1
3392 633		00 N	3398 441		00
3392 759	Fe	2	3398 511		0
3392 813		1	3398 551		0000 N
3392 926	Li	0	3398 746	Li	00 N
3393 029		0	3398 839		000
3393 113	Ni	3	3398 949		000
3393 160		1	3399 059		0
3393 285	Zn	1	3399 126	Fe, Zn	0000
3393 427		0	3399 294		00
3393 526	Fe	1	3399 376		2
3393 845		1 Nd?	3399 489		3
3393 980	Cu	2	3399 654	Fe	0
3394 062		1	3399 746		0000
3394 220	Fe	1	3399 942		0 N
3394 432		2	3400 153		0000 N
3394 518	Cu	0	3400 279	Ni	000
3394 685		3	3400 366		0000
3394 746	Fe	3	3400 549		000
3394 875		0000	3400 620		0000
3394 958	Co	0000	3400 770	Ni	1
3395 085		0000 N	3400 970		0000
3395 212		0	3401 121		1
3395 408		00 N	3401 307		1
3395 505	Co	3	3401 478	Fe	000
3395 544		2	3401 664		3
3395 750		0	3401 778		0000 N
3395 882		0	3401 900		0
3396 012	Ni	000	3401 992	Fe	000
3396 125		0	3402 058		000
3396 178		0	3402 208		000
3396 320		1	3402 262		000
3396 437	Ni	0	3402 352	Fe	000
3396 523		0	3402 400		3
3396 642		000	3402 553		3
3396 742		0000	3402 685		0
3396 792	Fe	00	3402 842	Li	0000
3396 965		0000	3402 925		000
3397 062		0000	3403 033		0
3397 116		3	3403 145		0000 N
3397 197	Fe	0000	3403 288	Cu	0000 N
3397 356		1	3403 401		2

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3403 478	Fe, I <sub>1</sub>	2	3409 346	Fe	2
3403 572	Ni	2	3409 530		000 N
3403 725		000 N	3409 711	Ni	2
3403 826		0	3409 803		0
3403 925		0000	3409 950	I <sub>1</sub>	2
3404 005		0000	3410 080		00
3404 128		0000	3410 170		1
3404 202		000 N	3410 313	Fe	2
3404 292		0000	3410 386	Zi	1
3404 413	Fe	2	3410 526		0000 N
3404 511	Fe	3	3410 696		00
3404 581		0000 N	3410 783		0000 N
3404 717	Pd	0	3410 923		00
3404 897		1	3411 035	Fe	2
3404 972	Zr	0	3411 160		00 Nd?
3405 044	C?	0	3411 274	Fe	1
3405 097		00	3411 366		0000
3405 217 } s	Co	2	3411 498	Fe	3
3405 302 } s		2	3411 700		0000
3405 504		000	3411 883		000
3405 637		00000	3412 009		000
3405 716	Fe	0	3412 109		000
3405 837		0000 N	3412 162		0000
3405 971	Fe	1	3412 302		0000 N
3406 111		000 N	3412 481	Co	5
3406 254		00	3412 595		0000
3406 304		00	3412 775	Co	4
3406 391		0000	3412 909		0000 N
3406 491		0000	3413 019		000
3406 572 s	Fe	3	3413 275	Fe	5 d?
3406 697		0	3413 402		000 N
3406 943 s	Fe	5 d?	3413 542		00
3407 187		000	3413 597	Ni	2
3407 338	Ti	2	3413 651		2
3407 447		2	3413 782		0
3407 537		00	3413 855		00
3407 597	Fe	4	3413 935		0000
3407 693		3	3414 079	Ni	4
3407 844		0000 N	3414 269		00 N
3407 937	Di?	0	3414 399		000 N
3408 091		00 Nd?	3414 535		000 N
3408 217		0	3414 643		1
3408 317		0000 N	3414 769		1
3408 484		0000 N	3414 911	Ni	15
3408 637		000 Nd?	3415 050		1 Nd?
3408 811		000 N	3415 230		0
3408 911	Cr	3	3415 279		00
3409 070		1	3415 462		0000 N
3409 210		0000	3415 575		0000
3409 302	Co	2	3415 672	Fe	3

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3415 815		0	3422 033		0000
3415 922		00 N	3422 087		0000
3416 029		0000	3422 260		I
3416 164		3	3422 347		0000
3416 274		0000	3422 468	Ni	I
3416 421		I	3422 629	Fe	4
3416 541		0000	3422 794	Fe	3
3416 644		000 N	3422 892	Cl	4
3416 771		00	3423 016	Ni	I
3416 808		0	3423 153		0000 N
3416 914		00	3423 307		000 N
3417 001		00	3423 380		00 N
3417 095	Ti	I	3423 453		000 N
3417 198		00	3423 667		00 N
3417 301	Co	3	3423 760		0 N
3417 401	Fe	I	3423 848	Ni	7
3417 491		000	3423 972		0 N
3417 618		0000	3424 127		0
3417 681		0000	3424 311		00
3417 819	Co	00	3424 432	Fe	4
3417 948	Fe	2	3424 579		0000 N
3418 002		2	3424 646	Co	0
3418 161		0000	3424 732		000
3418 303	Fe	I	3424 846		000
3418 448		0000 N	3424 966	/1	00
3418 654	Fe	5	3425 152	Fe	4
3418 864		000 N	3425 196		000
3419 013		I	3425 432		0000 N
3419 108		0000 N	3425 579		0000 N
3419 282	Fe	I	3425 716 s		2
3419 424		000 N	3425 879		0000 N
3419 554		000 N	3425 976		00
3419 836	Fe	2	3426 102		000
3420 013		000	3426 226		000
3420 133		000	3426 349		0000
3420 240		00	3426 466	Fe	3
3420 360		000	3426 535	Fe	3
3420 417		00	3426 769	Fe	3
3420 575		0	3426 897		2
3420 620		00	3426 929		0000
3420 730		000	3427 046		0000
3420 880	Ni <sup>9</sup>	2	3427 126	Fe?	2
3420 940	Mn	00	3427 263 s	Fe	3
3421 147		000	3427 340		I
3421 253		0000 N	3427 492		0000
3421 353	Ni, Cr, Pd	4	3427 596		0000
3421 482	Ni	2	3427 656		00
3421 620		0000 N	3427 746		0000 N
3421 758	Co	0	3427 899		000 N
3421 860		0	3427 972		000 N

Wave-length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3428 082	Fe, Co	0000 N	3434 117	Cr	0000
3428 154		0	3434 183		0
3428 341		4	3434 259		0
3428 459		0000	3434 383		0000
3428 561		1	3434 512		000
3428 626		1	3434 626		0000
3428 776		000	3434 746		0000
3428 892		2	3434 829		0000
3429 066		000	3434 962		000
3429 172		0000	3435 032		000
3429 282	Co	0000 N	3435 102	Cr	00
3429 468		00	3435 179		0000 N
3429 605		0000	3435 296		000 N
3429 718		0000 N	3435 382		000 N
3429 851		00	3435 509		0000 N
3429 951		000	3435 628		1
3430 071		0000 Nd?	3435 729		00
3430 218		0000 N	3435 819		0
3430 295		000	3435 962		0 N
3430 428		00	3436 174		1
3430 545	Zr	00 N	3436 250	Cr	0
3430 671		1	3436 332		2
3430 777		0000 N	3436 472		0000 N
3430 870		0000 N	3436 552		000 N
3431 020		000	3436 666		0000 N
3431 090		000	3436 786		0000
3431 207		0000	3436 882		000
3431 320		0000	3436 976		0000 N
3431 423		00	3437 116		000 N
3431 590		0000 N	3437 190	Fe	3
3431 721	Co	4	3437 282		00
3431 830		000	3437 427	N <sub>1</sub>	5 d?
3431 965	Fe	3	3437 616		0000Nd?
3432 077		000	3437 772		00
3432 157		0	3437 829	Fe	00
3432 270	Co	000	3437 926		0000
3432 350		0000	3438 012		0000
3432 447		0	3438 094	Zr	2
3432 550	Co	00	3438 236		000
3432 707		0000	3438 376	Fe	2
3432 863		0	3438 455		1
3433 023	Co	000	3438 556	Mn?	0000 N
3433 163		3	3438 639		000 N
3433 212	Cr, C?	2	3438 851		000 N
3433 290		0000	3439 092	Fe	2
3433 453	Pd	3	3439 171		2
3433 591		0	3439 268		0000 N
3433 715	N <sub>1</sub> , Cr	8 d?	3439 365	Fe	000 N
3433 905		0 N	3439 478		00Nd?
3434 053		0000	3439 635		000 N



# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS XVII

By HENRY A ROWLAND

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3439 735		ooo N	3444 217		oooo
3439 841		oooo	3444 402	Ni?	2
3439 941		oooo	3444 467	Ti	4
3440 008	Fe	3	3444 590		oooo N
3440 138		ooo N	3444 654		0
3440 235		oo N	3444 774		oooo
3440 328		ooo N	3444 847		oo
3440 505		o N	3445 030		ooo Nd?
3440 635		ooo N	3445 260	Fe	5
3440 762 s	Fe	20	3445 477		ooo N
3440 875		oo N	3445 597		ooo N
3441 021		ooo N	3445 741	Fe, Cr	2 N
3441 155 s	Fe	15	3445 905	Fe	2
3441 248		ooo N	3445 947		oooo
3441 391		o Na?	3446 127		oooo
3441 588	Cr	1 N	3446 240		1
3441 688	Pd	oooo N	3446 314		ooo
3441 808		oooo N	3446 406	Ni	15
3441 875		ooo	3446 536		1 Nd?
3442 035		oooo	3446 620		oooo N
3442 118	Mn	6	3446 747		oooo N
3442 188	Ni	1	3446 857		ooo
3442 284		1	3446 931		oo
3442 368		oo	3447 089		0
3442 503	Fe	2	3447 154		oo N
3442 696	Ni	0	3447 290		oooo N
3442 813	Fe	3	3447 420	Fe, Co	4
3442 921		oooo	3447 569	Cr	0
3443 059	Co	2	3447 674		oooo N
3443 101	Fe	1	3447 774		ooo
3443 181		oo	3447 901	Cr	0
3443 330	Co	0	3448 040		oooo N
3443 435		ooo N	3448 144		1
3443 517		1	3448 227		oooo
3443 575		oooo N	3448 340		o Nd?
3443 691		oooo	3448 494		ooo N
3443 791	Co	5 d?	3448 597		ooo N
3443 908		oo N	3448 727		ooo N
3444 020 s	Fe	8 N	3448 827		oooo N
3444 127		o N	3448 926		0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3449 003		0	3455 736	Cr	0
3449 099		0000	3455 828		0000 N
3449 186		0000	3455 928		0000Nd?
3449 310	Co	5 d?	3456 081		0000
3449 446		0000	3456 148		00
3449 583	Co	6 d?	3456 228		000
3449 766		0000 N	3456 383	Fe	0
3449 833		0000 N	3456 528	Ti	3
3449 996		000 Nd?	3456 634		0000 N
3450 123		000 Nd?	3456 714		0000 N
3450 275		00	3456 801	Ti	00 N
3450 373		0000 N	3456 944		000 N
3450 469	Fe	5	3457 068	Co	1
3450 589		0000 N	3457 230	Fe	2
3450 742		0000 N	3457 281		00
3450 882		0000 N	3457 414		0000 N
3450 995		000 N	3457 538		0000 N
3451 129		0000	3457 648	Fe, Zr	0
3451 255		00	3457 708		0
3451 369		0000	3457 758		000
3451 477		0	3457 908		0000 N
3451 609	Mn	0	3458 028		0
3451 761	Fe	2	3458 144		000
3451 915		0000 N	3458 254		0
3452 057	Fe	3	3458 442	Fe	3
3452 419	Fe	4	3458 601	Ni	8
3452 609	Ti	1	3458 728		0 N
3452 762		000	3458 834		0 Nd?
3452 919		00 N	3459 074	Zr	00
3453 039	Ni	6 d?	3459 194		0000
3453 169	Fe	2	3459 288		000
3453 255		000	3459 414		000
3453 355	La	0000	3459 568	Fe	2
3453 469	Cr	0	3459 714		0000
3453 621	Co	3	3459 761		0000
3453 705		2	3459 881	Fe	1
3453 885		00	3460 052	Fe	3 d?
3453 982		0000 N	3460 174	Mn,	2
3454 303	Ti	1	3460 294		0000
3454 455		00	3460 460	Mn,	4 d?
3454 602		0000 N	3460 568	Cr	000
3454 725		000 N	3460 691		0000 N
3454 829		0000 N	3460 741		0000 N
3454 934		0000 N	3460 874	Pd	00
3455 058		0000	3461 021		000 N
3455 121	Mn	000	3461 111		00
3455 204	Mn	000	3461 321	Co, La	0
3455 379 s	Co	5	3461 413		0000 N
3455 494		0000 N	3461 633	Ti	5
3455 601		0000 N	3461 801	Ni	8

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3461 930		o N	3468 612		o N
3462 073		oo N	3468 821		1
3462 217		oooo Nd?	3468 986	Fe	2
3462 347		ooo	3469 114		o
3462 492	Fe	1	3469 155	Fe	2
3462 667		oooo Nd?	3469 532		o
3462 867		oo N	3469 628	Ni	3
3462 950	Co	6	3469 736	Cr	o
3463 153	Zr	o	3469 826		oooo N
3463 323		oooo N	3469 972	Fe	2
3463 444	Fe	1	3470 076		oooo
3463 520		oooo	3470 156		oooo
3463 660		oooo N	3470 276		oooo N
3463 777		oooo Nd?	3470 380		ooo N
3463 937		oooo Nd?	3470 536		oo
3464 113		2	3470 678		o
3464 167		oo	3470 776		oooo
3464 275	Fe	1 d?	3470 876		oo
3464 608 s		1	3471 000		oooo
3464 843		ooo	3471 136		oooo
3464 970		oooo	3471 256		ooo
3465 052	Fe	o	3471 404	Fe, Zr	3
3465 167		oooo	3471 499	Fe, Co	3
3465 300		oooo	3471 598		o
3465 390	Cr	oo	3471 750		ooo
3465 467		oooo N	3471 856		ooo
3465 573		oooo N	3471 910		oooo
3465 687		1	3472 035		1 N
3465 779		1	3472 190		oo N
3465 900 } s	Co	4	3472 316		o N
3466 015 }	Fe	6	3472 443		oo N
3466 137		oo N	3472 593		o
3466 187		oo N	3472 680	Ni	{ 5
3466 320		oo	3472 730		{ 2
3466 420		o	3472 850		oooo N
3466 507		oooo N	3472 916		ooo
3466 639	Fe	3	3473 040		ooo
3466 773		o	3473 146		ooo
3466 853		oooo	3473 190		oooo
3467 033	Fe	2	3473 363		oooo
3467 153		ooo N	3473 435	Fe	2
3467 270		ooo N	3473 637	Fe	1
3467 407	Ti	oo	3473 756		o
3467 517		oooo N	3473 823	Fe	1
3467 644	Ni	3	3473 950		oooo
3467 845	Ni, Cr	2	3474 106	Co	2
3468 007		ooo	3474 197	Mn	2
3468 210		oo	3474 287	Mn	2
3468 347		oooo N	3474 410		oooo
3468 486		oooo N	3474 523		oooo

Wave length	Substance	Intensity and Character	Wave-length	Substance	Intensity and Character
3474 576	Fe	2	3480 549		000
3474 669		00	3480 669	Ti	1
3474 800		000	3480 785		0000 N
3474 904		1	3480 875		0000 N
3475 023		00	3481 024	Ti	2
3475 143		0000 N	3481 195		00 N
3475 270		2	3481 302	Pd, Ti Zr	2
3475 406		0	3481 439	Cr	0
3475 456		00	3481 589		0000
3475 594 s	Fe	10	3481 695	Fe, Cr	2
3475 656		0 N	3481 802		0000
3475 802	Fe	2	3481 889		000
3475 894		1	3481 952	Fe	00
3476 010	Fe	2	3482 075		000
3476 163		000 N	3482 195		000
3476 330		0000 N	3482 325	Fe	1
3476 479	Co, Fe	3	3482 589		000
3476 590		0000	3482 712		000 Nd?
3476 756		0	3482 855	Zr	00
3476 849 s	Fe	8	3483 047	Mn	5 d?
3477 002	Fe	1	3483 155	Fe	4
3477 125	Fe, Ti	3 d?	3483 295		0000
3477 323	Ti	5	3483 553	Co	3
3477 500		000	3483 667	Fe, Zr	0
3477 636		00	3483 769		000
3477 770		0	3483 923	Ni	6 d?
3477 856		0000	3484 023		1
3478 002 s	Fe, Ni	4	3484 172		0000 N
3478 123		000	3484 295		3
3478 256		0000 N	3484 352		00
3478 316		0000 N	3484 482		000 Nd?
3478 438	Ni, Zr	0	3484 692		0000 Nd?
3478 504	Fe	0	3484 809		0000 N
3478 689	Co, Zr	0	3484 922		00
3478 772	Fe	1	3484 995	Fe	1
3478 876		0000	3485 121	Fe	2
3478 923	Co	0	3485 249		1
3479 053		000	3485 369		0000 N
3479 163	Zr	0	3485 493	Fe Co	6
3479 273		0000	3485 645		0000 N
3479 401	Ni	1	3485 719		0000 N
3479 531	Zr	2	3485 845		00 N
3479 703		0000 N	3486 041 s	Ni	5
3479 829	Fe	1	3486 179		0000
3479 969		0	3486 282		0000
3480 061		1	3486 362		000
3480 171		00	3486 475		000
3480 315	Ni	1	3486 522		0000
3480 442		0000	3486 691	Fe	2
3480 476	Fe, Zr	2	3486 782		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3486 889		0000	3493 313		0 N
3486 962		0000	3493 430	Ti, Fe	1
3487 095	Mn	00 N	3493 618		2
3487 145		0000	3493 721		00
3487 289		0000	3493 834	Fe	1
3487 415		0000	3494 004		00
3487 542		000	3494 154		0000 N
3487 743		2	3494 308	Fe	2
3487 857	Co, Ca	0	3494 401		0000
3487 959		000	3494 498		0000
3488 131		2	3494 551		0000
3488 289		0000 Nd?	3494 654		0
3488 437	Ni, Mn	0	3494 815	Fe	2
3488 589		000	3494 871		000
3488 702		0000 N	3494 994		0000 N
3488 817	Mn	4	3495 108	Cr	00
3488 965		1	3495 178		0000 N
3489 142		00 Nd?	3495 384		0
3489 302		00 N	3495 423	Fe	3
3489 392		0000 N	3495 522		2
3489 546	Co	5	3495 658		000
3489 813	Fe	3	3495 802	Co	3
3489 889	Ti, Pd	2	3495 853	I <sub>1</sub>	2
3490 048		0000	3495 974	Mn	2
3490 104		0000	3496 024	Fe	2
3490 191		0000	3496 101		0000
3490 301		0	3496 224	Co	0
3490 341		0000	3496 348	Zi	2
3490 441		0000	3496 491	Ni	0
3490 534		00	3496 614		0000 N
3490 628		0	3496 721		0
3490 733 s	Fe	10 N	3496 820	Co	3
3490 896	Co	0	3496 952	Co, Mn	3
3491 008		000 Nd?	3497 148		1
3491 195	Ti	5	3497 241	Fe	3
3491 354		000	3497 301		2
3491 462 s	Co,	4	3497 421		0000 N
3491 661		0000 N	3497 534		0
3491 894		000	3497 668	Mn	3
3492 021		0000 N	3497 874		0 N
3492 112	Co	00	3497 982 s	Fe	8
3492 174		0000	3498 116		0
3492 284		0000	3498 322		1 N
3492 368		000 N	3498 451		0000 N
3492 508		00 N	3498 534		0000 N
3492 678		000 N	3498 668		00
3492 858		000 N	3498 888		1
3492 954		00 N	3499 084		00
3493 114	Ni	10 N	3499 248	Ti	0
3493 228		000 N	3499 408		00

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3499 492		0	3505 371		0000
3499 608		0000 N	3505 433		0
3499 711		0	3505 525		0000
3499 848		0000 Nd?	3505 628	Z <sub>1</sub>	0
3499 974		0000	3505 810	/r V	I
3500 013		0	3505 928		0000
3500 131		000	3506 038		0
3500 296		0	3506 189		000
3500 474	Ti	3	3506 380	Fe	I
3500 577		0000	3506 467	Co	5
3500 706 s	Fe	2	3506 645	Fe	3
3500 830		0000 N	3506 733	li	I
3500 996 s	Ni	6 d?	3506 793		0000
3501 094		0000	3506 891		0000
3501 210		0000	3506 980		0
3501 296		0000	3507 077		0000
3501 394		0000	3507 284		2
3501 472		000	3507 350		0
3501 605		000 N	3507 447		0000
3501 710		0000 N	3507 543	Fe	I
3501 841		0	3507 687		0000 N
3501 868		0	3507 837	Ni	3
3501 970		000 N	3507 957		000
3502 104		000 N	3508 090		00
3502 165		0000	3508 234		000
3502 394		{ 3	3508 350		I
3502 466	Co	{ 3	3508 487		0000 N
3502 608		00	3508 626	Fe	3
3502 737	Ni	2	3508 670	Fe	2
3502 775	Co	2	3508 847		0000 N
3502 899		0000	3509 037		00
3503 001		00	3509 157		0000
3503 112		0000	3509 264	Fe	2
3503 256		000 N	3509 470		0000
3503 442		000 N	3509 570		0000
3503 612		I	3509 690		0000
3503 699		0000	3509 870		I
3503 866	Co	00 Nt?	3509 992	Co, Fe	4
3504 048		00	3510 209		000
3504 192		0000	3510 331		I
3504 332		0000	3510 466	Ni	8
3504 399		0000	3510 596	Co, Fe	2
3504 581	Fe, V	2	3510 693		00
3504 733		0000	3510 824		I
3504 823		I	3510 985 s	Ti	5
3504 885	Co	0000	3511 209		0000 Nd?
3505 015	Fe	3	3511 356		0000
3505 056	Ti	2	3511 453		0000
3505 202	Fe	3	3511 583		0000
3505 288	Co	0000	3511 676		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3511 763	Mn	0	3518 790	Ni	4
3511 883	Fe	1	3518 825	Fe	3
3511 978	Mn	2	3518 933		0000
3512 066		00	3519 014	Ti, Fe	3
3512 228	Fe	1	3519 239	Ti?	0000Nd†
3512 369	Fe	2	3519 531		0000
3512 520		000	3519 645		0000
3512 639		0000	3519 758		0000
3512 785	Co	6	3519 904	Ni	7
3512 869		00	3520 021		0000
3512 950		00	3520 168		2
3513 100	Fe	1	3520 228	Co	3
3513 200	Fe	2	3520 397	Ti	2
3513 422		0000 N	3520 531		0000
3513 623	Co	5	3520 675	Fe	000
3513 744		000	3520 751		0000
3513 868		00	3520 871		0000
3513 965 s	Fe	7	3520 991	Fe, Zr	2
3514 082		4	3521 118		0000
3514 138	Ni	3	3521 205		0
3514 382		0000 N	3521 318		00
3514 608		0	3521 410 s	Fe	8
3514 775	Fe	2	3521 686		3
3515 206	Ni	12	3521 748	Co	4
3515 549		0	3521 888		000
3515 675		00	3521 984	Fe	2
3515 787		0000	3522 184		0000
3515 947		0000 N	3522 284		0000
3516 021		0000 N	3522 412	Fe	4
3516 156		000	3522 589		00
3516 261		0000	3522 677		0000
3516 359	Ni	2	3522 757		0000
3516 441		0000	3522 877		000
3516 554	Fe, Co	2	3522 974		000
3516 701	Fe	2	3523 048	Fe, Co,	2
3516 854		0000	3523 212	Ni	1
3516 959		0	3523 324		0
3517 093	Pd	00	3523 452	Fe	2
3517 173		0000	3523 584	Co	4
3517 310		0000 N	3523 700		000
3517 446	-, V	3	3523 850	Co	0
3517 523		0000	3523 924		0000
3517 653		000 N	3524 130		000
3517 860		0000 N	3524 221	Fe	3
3517 960		0000 N	3524 385	Fe	3
3518 103		0000	3524 499		0
3518 200		0000	3524 677	Ni	20
3518 360		0000	3524 883		1
3518 488 s	Co	5	3525 063		000 N
3518 636		0000	3525 271		000 N

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3525 416		0000	3532 143	Mn	4
3525 529		0000	3532 262	Mn	3
3525 656		0000	3532 469		000
3525 759		2	3532 601		0000
3525 986	Fe	4	3532 721	Fe,	4
3526 103		00	3532 777		00
3526 183	Fe	6	3533 041		0000
3526 311		3	3533 156	Fe	6
3526 398	Fe	2	3533 345	Fe	6
3526 526	Fe	2	3533 506	Co	5
3526 625		2	3533 680		0000
3526 686		0	3533 836	V	000
3526 821	Fe	4	3534 000	Ti	1
3526 988	Co	6	3534 206		0000
3527 115		0	3534 400		000
3527 252		00	3534 672	Fe	2
3527 368		0000	3534 733		0000
3527 458		000	3534 830		0000
3527 588		0000	3534 920	Co	000
3527 672		000	3535 060	Fe	3
3527 750		1	3535 090		00
3527 936	Fe	5	3535 180		0000N
3528 041		0	3535 300		0000N
3528 133	Ni	4	3535 446	C	000
3528 382		0	3535 554	Li	4
3528 465		00	3535 660		0000
3528 552		0000	3535 766	C	000
3528 715		0000N	3535 868		3
3528 928		0000	3535 989		0000
3529 035	Ni	1	3536 165		00
3529 181	Co	3	3536 259		0000
3529 328		00	3536 405		0000N
3529 495		00	3536 709	Fe	7
3529 662	Fe	2	3536 832		0000
3529 768	Ni	1	3536 934		00
3529 872		00	3537 025		0000
3529 964	Fe-Co	6	3537 105		00N
3530 136		0000	3537 265		0000Nd?
3530 264		0000	3537 385	Ni, C	1
3530 374		0000	3537 439		0000
3530 533	Fe	3	3537 638	Fe	2
3530 734	Ni, Li	1	3537 772	Co	0
3530 919		3	3537 879	Fe	3
3531 107		00	3538 045	Fe	4
3531 247		0000N	3538 219		0000N
3531 424		0000N	3538 399		1
3531 582	Fe	2	3538 452	Fe	1
3531 761		0000	3538 555		0000
3531 851		1	3538 643		1
3531 982	Mn	3	3538 701	Fe	2



# TABLE OF SOLAR SPECTRUM WAVE-LENGTHS

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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3538 832		0000	3544 888		0000
3538 937	Fe	1	3545 001		0000
3539 081	C	00	3545 054	C	000
3539 218	C	00	3545 128	C	000
3539 391		0000	3545 194		0000
3539 513		0000	3545 336 s	-, V	4
3539 588		000	3545 481		0000 N
3539 684		0000	3545 654	C	0
3539 771		0000	3545 786	Fe, C	5
3539 892		00	3545 971	Fe, C	3
3540 038	C	00 N	3546 048		0000
3540 098		0000	3546 161		0000
3540 268 s	Fe	5	3546 348		1
3540 464	C	000	3546 488		0000
3540 538		000	3546 568		0000
3540 644		0000 N	3546 684		00
3540 857	Fe	3	3546 851	Co	00
3540 950	Fe	2	3546 921		000
3541 108		00 N	3546 974		000
3541 237	Fe	7	3547 121		0000
3541 384		00 N	3547 168	Tl	0
3541 474		000	3547 320		3
3541 687	C	000	3547 362	Fe	3
3541 790		0000	3547 511		0000Nd?
3542 017	C	000	3547 640		0000
3542 129	Ni	0	3547 780		000 N
3542 232	Fe	6	3547 941	Mn	5
3542 397	Fe	3	3548 087		00
3542 473		0000	3548 175	Mn, Fe	3
3542 583		0000	3548 332	Mn, Ni	5
3542 633		0000	3548 447		0000
3542 713	Li	00	3548 593	Co	00
3542 775	Zr	00	3548 687		000
3542 910		0000 N	3548 793		0000
3543 090		0000	3548 880		0000
3543 143		0000	3549 047		0000 N
3543 243		0000	3549 151 s	Y ?	2
3543 310		0000	3549 260		0000
3543 407	Co	2	3549 384		1
3543 531	Fe	2	3549 513	C	0
3543 637		0000	3549 667	C	00
3543 824	Fe	3	3549 773		0000
3543 937		0000	3549 907		0000Nd?
3544 075	C	0000	3550 014 s	Fe	3
3544 155	C	000	3550 247		0000
3544 229		0000	3550 363	C	1 N
3544 371		1	3550 510		000
3544 489		0000	3550 627	C	0000
3544 662		000	3550 740	Co	4
3544 776	Fe	3	3550 939	C	000 Nd?

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3551 092	C	0000 N	3557 036		3
3551 253		I	3557 204		0000
3551 370	C	000	3557 304		000
3551 542		000	3557 370		000
3551 674	Ni	4	3557 495		00
3551 800		I	3557 604		0000
3551 912		0000	3557 817		0000
3552 012		0000	3557 907		0000
3552 098	Zr	I	3558 020		0000 N
3552 253	Fe	2	3558 140		0000
3552 449		0000 N	3558 214		I
3552 574		0	3558 350		000
3552 699		0000	3558 477		00 N
3552 866	Co	I	3558 570		0 N
3552 986	Fe	5	3558 672 s	Fe	8
3553 086		000	3558 774		0 N
3553 132	Co	I	3558 923	Co	I
3553 236		000	3559 017		0000
3553 304	Pd	00	3559 124		0000
3553 416		0000	3559 219	Fe	I
3553 491		0000	3559 347		00
3553 624	Ni	3	3559 414		0000
3553 735		0000	3559 604		I
3553 887	Fe	5	3559 656	Fe	3
3554 011		000	3559 750		0000
3554 115		0000	3559 840		0000
3554 203	Fe	5	3559 954		000
3554 418		000	3560 063	Ni	0
3554 438		0000	3560 216		00
3554 593		2	3560 303		000
3554 651	Fe	3	3560 436		000 N
3554 789		I	3560 556		000
3554 938		0 N	3560 649		0000
3555 079	Fe	9	3560 729		I
3555 185		0 N	3560 843	Fe	2
3555 318		000 N	3560 942		0000
3555 425		0000	3561 037	Co	4
3555 498		0000	3561 203		0000
3555 598		2	3561 276		0000
3555 758		0000	3561 419		0000
3555 865		0000	3561 516		0000
3555 945		0000	3561 609		0000
3556 088		000 Nd?	3561 718	Li	I
3556 291		000	3561 796		0000
3556 405		0000	3561 898	Ni	3
3556 515		0000	3562 043	Fe, Li	I
3556 631		0000	3562 161		0000
3556 738	Zr	2	3562 236	Co	0 N
3556 830	Fe	2	3562 331		0000
3556 944	Fe	4	3562 410		I

# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS XVIII

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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3562 549		0000	3567 517	Fe	1
3562 689		0000	3567 594		0000
3562 746		0000	3567 711		0000
3562 848		0000	3567 835		4
3563 065	Co	o N	3567 881		2
3563 152		ooo	3568 083		oo
3563 298		ooo N	3568 147		0000
3563 542		ooo N	3568 281		0000
3563 750		oo	3568 387		oo
3563 855		0000	3568 451		0000
3563 928		ooo N	3568 587	Fe	3
3564 065		0000 N	3568 767		oo
3564 264	Fe Co	4	3568 968	Fe	3
3564 418		0000	3569 122	Fe	4
3564 537		0000	3569 281		0000
3564 664 } s	T <sub>1</sub>	3	3569 371		0000
3564 705 } s	Fe	2	3569 523	Co	5
3564 822		ooo	3569 649	Mn	4
3564 935		oo	3569 761		0000
3565 075	Co	4	3569 873		o
3565 128		3	3569 958	Mn	2
3565 268		1 N	3570 060		ooo
3565 445		3 N	3570 183 } s	Mn	4
3565 535 s	Fe	20	3570 273 } s	Fe	20
3565 735		4	3570 415 s		4
3565 855		ooo N	3570 566		0000
3565 977		o	3570 660		o
3566 111	T <sub>1</sub>	1	3570 736		0000
3566 227		ooo	3570 826		0000
3566 314		2 N	3571 000		0000
3566 454	Cr	o N	3571 126		o
3566 522	Ni	10	3571 250	Pd	0000
3566 624		o	3571 374	Fe	3
3566 728		1	3571 546		oo
3566 807		0000	3571 690		0000
3566 897		0000	3571 828		2
3566 984		0000	3571 913		ooo
3567 061		1	3572 014	Ni	6
3567 181	Fe	2	3572 145	Fe	5
3567 334		0000 N	3572 280		oo

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3572 460		0000	3578 530	Fe	4
3572 617		4	3578 702		0
3572 712	,Sc	6	3578 832	Cr	10
3572 890	Cr?	00	3578 978		000
3573 017		0000 N	3579 047	Co	0
3573 087		0000 N	3579 122		00
3573 207	Fe	1 N	3579 185		00
3573 320		0000	3579 268		0000 N
3573 417		0000	3579 508		000 N
3573 540	Fe	2	3579 648		0000
3573 650		0000	3579 702		1
3573 792	Ti	2	3579 812		0000
3573 874	Fe	3	3579 974		2
3573 975	Fe	3	3580 098		000 N
3574 050		2	3580 227		00
3574 135		0	3580 356		1 N
3574 174		0	3580 552		1
3574 297		0000	3580 682		1 N
3574 394	Ti	0	3580 808		0 N
3574 499		000	3581 067		5
3574 559	La	1	3581 184		1
3574 723		0000 N	3581 349 s	Fe	30
3574 944	Cr	0	3581 531		1
3575 106	Cr-Co	5	3581 617		0
3575 260	Fe	3	3581 805	Fe	2
3575 391	Fe	3	3581 957	Fe	2
3575 494	Fe	2	3582 081		1
3575 533	Co	2	3582 231		00
3575 699		000	3582 345	Fe	5
3575 904	Zr	00	3582 471		2
3576 118	Fe	4	3582 577		000
3576 296		0000	3582 711	Fe	2
3576 393		0000	3582 838	Fe	3
3576 469		4	3582 884		00
3576 527	,Sc?	3	3583 017		0000
3576 739		0000	3583 104		000
3576 906	Fe	2	3583 244		0000
3577 003	Zr	1	3583 357		000
3577 099		0000	3583 481 s	Fe	5
3577 203		000	3583 581		0000
3577 299		000	3583 637		0000
3577 384	Co	1	3583 737		0000
3577 532		000	3583 837	,C	3
3577 605		1	3584 051	,C	3
3577 705		0000	3584 147		0000
3577 885		0000	3584 237		0000
3578 014	Mn	5	3584 397		0000
3578 138		0000	3584 457		000
3578 240	Co	1	3584 523		0000
3578 358	Ti	00	3584 616		0000

Wave length	Substance	Intensity and Character	Wave-length	Substance	Intensity and Character
3584 660 s	Y	2	3590 803	Fe	00
3584 800	Fe	6	3590 976		0000 N
3584 940	Co	5	3591 149	Fe	1
3585 105	Fe	6	3591 283		0000
3585 214		000	3591 366		0000
3585 310	Co	5	3591 496	Fe	2
3585 479	Fe	7	3591 629	Fe	2
3585 658		2	3591 732		0000
3585 777		000 N	3591 885		0000 N
3585 859	Fe	6	3592 045		0000 N
3585 984 s <sup>1</sup>	C	0	3592 169	V?	2
3586 047 s	C	00	3592 348		0000
3586 157	Co	1	3592 412		000
3586 268	Fe	4	3592 508		0000
3586 390		000	3592 619	Fe	1
3586 494		00	3592 745		000
3586 624		0000	3592 819	Fe	3
3586 684	Mn	4	3592 935		0000
3586 890		3	3593 040	Y	0
3587 024		0	3593 158		0000
3587 130	Fe	8	3593 223		0
3587 286	Ti	2	3593 402		000
3587 370	Co	7	3593 481	Fe	3
3587 497		000	3593 636	Cr	9
3587 574	Fe	3	3593 835		000
3587 757	C	0000 N	3593 935		000
3587 899	Fe	5	3594 138		000 N
3588 084	Ni	6	3594 245		000
3588 263	C	000	3594 458		0000
3588 387		0	3594 528		0000
3588 466	C	00	3594 784	Fe	6
3588 563		0000	3595 017	Co	3
3588 675		3	3595 161		0000
3588 763	Fe	4	3595 256	Mn	1
3588 916	C	0000	3595 449	Fe, Ti	2
3589 065	Fe, C	2	3595 554		0000
3589 253	Fe	4	3595 681		0000 N
3589 363	C	0000	3595 824		000
3589 446	C	000	3596 012	Fe	1
3589 601	Fe	2	3596 195	Ti	4
3589 773		5	3596 346	Fe	1
3589 908		5 d?	3596 454		0000
3590 023	C	0000	3596 534		0000
3590 109	Mn, C	00	3596 651	Co	0
3590 235	Fe, C	1	3596 787		0000
3590 383		0000	3596 894		0000
3590 443		0000	3597 001		0000
3590 509 <sup>2</sup>	C	2 N	3597 189 s	Fe	5 d?
3590 609		2	3597 294		0000
3590 651		2	3597 394		0000Nd?

<sup>1</sup> Beginning of second head of carbon band<sup>2</sup> Beginning of first head of carbon band

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3597 541		0000	3603 719		2
3597 654		0000	3603 762		2
3597 854	Ni	8	3603 832		2
3597 994	Fe	00	3603 922	Ti	3
3598 121		0000	3603 972	Fe	4
3598 167		0000	3604 091		1
3598 324		0000 N	3604 259		0000 N
3598 414		1	3604 419	Ti	1
3598 611		0000 N	3604 519	Fe	2
3598 754		0000	3604 605		0000
3598 862	Ti, Fe	1	3604 699		0000
3598 953		0000	3604 843		1
3599 081	Fe?	2	3604 945		0000
3599 128	Fe?	2	3605 073		000
3599 287	Fe	2	3605 159		000
3599 523		000 N	3605 222		00
3599 686		0000	3605 341	Fe?	5
3599 774	Fe	3	3605 479 s	Cr	7
3599 906		0000	3605 615	Fe	4
3599 973		0000	3605 669 } s	Fe	4
3600 112		1	3605 832		0000 N
3600 313		0000 N	3606 059	Fe	1
3600 513		0000	3606 179		000
3600 596		0000 N	3606 272		0000
3600 733		0000	3606 391		0000
3600 880 s	Y	3	3606 518		0
3600 966		0000	3606 678	Fe	2
3601 060		0000	3606 751		1
3601 220		0000 N	3606 838 s	Fe	6
3601 340		000	3606 994	Ni	1
3601 426		0000	3607 144		0000
3601 500		0000 N	3607 264		0000
3601 570		000	3607 391	Zr	0000
3601 686		0000	3607 518		000
3601 806	Cr	0	3607 672	Mn	3
3601 930		0000	3607 764		0000
3602 060 s	Y	1	3607 911		0000 N
3602 210	Co	3	3608 004		000 N
3602 253	Fe	2	3608 111		0000
3602 559	Ni	4	3608 149		2
3602 611	Fe	3	3608 291	Fe	4 d?
3602.686	Fe	4	3608 458		000 N
3602 739		0000	3608 551		000
3602 849		000	3608 630	Mn	3
3602 912		0	3608 728		00 N
3603 019		0000	3608 778		000 N
3603 112		0000	3608 871		1 N
3603 238		1	3609 008 s	Fe	20
3603 354	Fe	5	3609 134		0 N
3603 579		0000	3609 244		0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3609 467	Ni	5d?	3615 462		0000
3609 611		2	3615 531	Co, Mn	00
3609 697	Pd	00	3615 669		0000 N
3609 853		0000 N	3615 802	Fe	3
3609 907		000 N	3615 949		0000
3610 017		0000 N	3616 100	Fe	0
3610 195		0 N	3616 294		2
3610 305	Fe, Ti	5	3616 357		1
3610 435	Mn	2	3616 465	Fe	1
3610 599	Cd?	4	3616 569		0000
3610 647	Ni	5	3616 710	Fe	4
3610 841	Fe	3	3616 866		0000 N
3610 970		0000	3617 016		0000 N
3611 083		0000 N	3617 149		0
3611 189 s	Y, Mg?	2	3617 243	Fe	1
3611 323		1	3617 315		0000
3611 443		000	3617 457	Fe	3
3611 598	Ni	0	3617 575	Mn	2
3611 697		00	3617 677		000
3611 862	Co,-	2	3617 855 } s	Ca?	1
3612 037	Zr	00	3617 934 }	Ca?	6
3612 213 s	Fe	4	3618 098		2 N
3612 383		0000 N	3618 228		0000
3612 520		0000 N	3618 325		000
3612 657		000	3618 441	Ca?	3
3612 743		000	3618 532	Fe	3
3612 882	Ni	6d?	3618 661		00
3613 079	Fe, Cd	3	3618 753		1 N
3613 247		2	3618 919 s	Fe	20
3613 314	Fe	1 N	3619 061		0
3613 470		0000	3619 138		00 N
3613 587	Ti	2	3619 253		0
3613 739	Ti	2	3619 412	Mn	1
3613 857		0	3619 539	Ni	8
3613 947	-,Sc	4	3619 675		0 N
3614 019		3	3619 809		00
3614 090		0000	3619 915	Fe	2
3614 159		0000	3620 076		1
3614 257	Fe	2	3620 171		0
3614 446		0000 N	3620 295		0000
3614 549		0000	3620 387	Fe	2
3614 697	Fe	2	3620 578		0000
3614 789	Zr	0000	3620 609	Fe	3
3614 856	Fe	2	3620 758		0000 N
3614 922		2	3620 911		0000 N
3615 029		00	3621 018	Fe	1
3615 142		0000	3621 110	Y?	00
3615 222		0000	3621 244		3
3615 336	Fe	1	3621 340		2
			3621 400		0

Wave length	Substance	Intensity and Character	Wave-length	Substance	Intensity and Character
3621 520		0000 N	3627 763		000
3621 612 s	Fe	6	3627 855		00
3621 740		0000	3627 953	Co	4
3621 864	Fe	2	3628 099		0000 N
3622 007		0000 N	3628 238	Fe	2
3622 147 s	Fe	6	3628 419		000 N
3622 297		0	3628 579		0000 N
3622 407		0000	3628 739		00
3622 577		0000 N	3628 847 s	Y, Mg?	2
3622 694		0000 N	3628 967	La	2
3622 794		000	3629 019		0000
3622 934		0000	3629 146		0000
3623 040		0000	3629 286		0000Nd?
3623 180		0000	3629 492		000 N
3623 234		0000	3629 652		0000 N
3623 362 s	Fe	5	3629 877	Mn	1
3623 460		0000	3630 045	Ni	1
3623 588 s	Fe	2	3630 164		1
3623 650		00	3630 252		0000
3623 750		0000	3630 374		0
3623 925	Mn, Fe	4	3630 492	Fe	4
3624 057		1	3630 618		0000
3624 204		2	3630 718		0000
3624 258	Ca	3	3630 798		0000
3624 447	Fe Co	3	3630 876		4
3624 600		0000 N	3630 918		3
3624 707		0000	3631 124	Ca	2
3624 873	Ni	4	3631 244	Fe	3
3624 979	Ti, Fe	5	3631 404	Co	1
3625 103	Co	1	3631 495	Ti?	0
3625 287	Fe	5	3631 605 s	Fe	15
3625 389		0000	3631 725		0
3625 506		0000 N	3631 850	Co	1
3625 641		1	3631 928		000 N
3625 766		0000 N	3632 098		2
3625 893		000	3632 193	Fe	3
3625 993		0000	3632 312		0
3626 073		0000	3632 438		00
3626 156		0000	3632 585		0000
3626 249	Ti	0	3632 700	Fe	3
3626 327	Fe	1	3632 832		0000
3626 526		0000 N	3632 979	Co, Cr, Zr	1
3626 633		0000 N	3633 123	Fe	4
3626 746		0000	3633 215		2
3626 877		2	3633 277	Y	2
3627 046		0000 N	3633 447		0000 N
3627 201	Fe	2	3633 651	Ti	00 Nd?
3627 309		000	3633 791		000
3627 499		000 N	3633 974	Fe	4
3627 596		000 N	3634 031		1



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3634 144		0000 N	3639 588	Co	2
3634 337		3	3639 663	Pb	1
3634 417		000	3639 833		0000
3634 471	Fe	3	3639 943	Cr	2
3634 551		1	3640 123		0000
3634 611		00	3640 256		0000 N
3634 674		000	3640 403		0000
3634 757	Pd	0000	3640 535 s	Cr Fe	6
3634 849	Fe Co	4	3640 783		000
3635 004		0000	3640 903		0000
3635 091	Ni	3	3641 043		0000
3635 164		1	3641 170		1
3635 224		0000	3641 366		0000 N
3635 336	Ti, Fe	2	3641 473	Ti	4
3635 419		000	3641 597	Mn, Cr	1
3635 491		00	3641 784	Ni	1
3635 608 s	Ti, Fe	4	3641 930	Co	0
3635 791		000 N	3641 970	Cr	1
3635 967		00	3642 102	Fe	00
3636 034		0000	3642 285		0000 N
3636 184		0000	3642 419		000 N
3636 305	Fe	3	3642 536		000
3636 377	Fe	2	3642 675		0000
3636 624		1	3642 820	Ti	7
3636 728	Cr	2	3642 912	Sc	2
3636 802	Fe	2	3642 965		3
3636 890	Co	2	3643 109		0000
3637 004		0000	3643 262	Fe	2
3637 139		2	3643 342	Co	1
3637 197	Fe	1	3643 492		0000
3637 397	Fe	1	3643 615		0000
3637 456		0000	3643 764	Fe	4
3637 583		0000	3643 867	Fe?	2
3637 693		00	3643 949		3
3637 876	Fe	0	3644 089		000
3638 011	Fe	4	3644 212		0000 N
3638 113		000	3644 289		0000 N
3638 196		0000	3644 455		0000 N
3638 242		1	3644 555	Ti, Ca	5
3638 306		1	3644 729		0
3638 383		1	3644 833	Ti, Fe	1
3638 442 s	Fe	3	3644 932	Fe	3
3638 610		0000	3645 117		0
3638 743		0000	3645 221	Fe	2
3638 910		0000	3645 325		0000
3639 043		000	3645 429		3
3639 168	V	0	3645 475	Sc?, La	3
3639 270		0000	3645 552		00
3639 423		1	3645 636	Fe	3
3639 470		0000	3645 765		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3645 967	Fe	4	3652 691 s	Co	3
3646 074		0000	3652 820		0000Nd?
3646 128		0000	3653 023		0000
3646 236		00	3653 160		0000
3646 335	Ti	1	3653 260		0000
3646 491		0000 Nd?	3653 340		0000
3646 643		000	3653 492		1
3646 757		2	3653 637 s	Ti	5
3646 948		000 N	3653 799		0000
3646 976		00 N	3653 900	Fe	2
3647 128		2	3654 052	Cr	2
3647 234	Co	0	3654 119	Fe	2
3647 394		0000 Nd?	3654 266		0000 N
3647 561	Fe	4	3654 392		0000 N
3647 701		0	3654 526		0000
3647 808		0	3654 586	Co	00
3647 988 s	Fe	12	3654 738	Ti	2
3648 221	Co	0 N	3654 813	Fe	1
3648 367		0	3654 999	Hg?	0000
3648 461		00 N	3655 143	Fe	2
3648 669	Cr	0	3655 199		0000
3648 778		0000	3655 359		00
3648 898		0000	3655 495		1
3648 954		000	3655 609	Fe	3
3649 137	Cr	1	3655 719		0000
3649 234		0000	3655 801		3
3649 324		0000	3655 990		0000
3649 438	Fe	4	3656 080		0000 N
3649 476	Co	3	3656 217		0000
3649 654	Fe, La	5	3656 358	Fe	3
3649 838		00	3656 404	Cl	2
3649 977	Co	1	3656 496		1
3650 178	Fe	4	3656 687		000
3650 423	Fe	5	3656 844		0000Nd?
3650 507		0000	3656 997		0000 N
3650 681		2	3657 104	Co	0
3650 860		0000 N	3657 275	Fe	2
3651 027		0000 N	3657 437		0000 N
3651 179		00	3657 562	Fe	1
3651 247	Fe,-	6	3657 710		0000 N
3651 337		00	3657 850	Fe	1 N
3651 400		0000	3657 957		0000
3651 493		0000 N	3658 044	Co, Fe, Mn	3
3651 614	Fe	7	3658 163		1
3651 794		1	3658 238	Ti	1
3651 940	, Sc	4	3658 306		0000
3652.061		1	3658 413		0000 N
3652 247		0000	3658 529		000 N
3652 400		00	3658 689 s	Mn-Fe	1
3652 537		0000	3658 783		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3659 003		0000 N	3664 760	Y	2
3659 109		0000 N	3664 838	Fe	2
3659 263		0000 N	3664 965		000 N
3659 373		0000 N	3665 082		000 N
3659 449		0000	3665 165		00 N
3659 663	Fe	5	3665 325		0000
3659 759		0000	3665 441		0000
3659 901	Fe T <sub>1</sub>	5	3665 574		0000
3660 016		0000	3665 731		0000
3660 109		0000 N	3665 861		00
3660 349		00	3665 987		0000
3660 467	Fe	2	3666 134	N <sub>1</sub>	0
3660 549	Mn	1	3666 201	Fe	1
3660 663		0000	3666 301		0000
3660 774	T <sub>1</sub>	2	3666 387	Fe	{ 3
3660 916		2	3666 421		{ 2
3661 059		0000 N	3666 504		0000
3661 176		000 N	3666 676		1
3661 289		0000	3666 781	Cr	00
3661 396		0000	3666 907	Fe	3
3661 506	Fe	3	3666 986		000
3661 675		0000	3667 068	Fe	3 Nd?
3661 775		0000	3667 234		0000 Nd?
3661 875		0000	3667 397 s	Fe	4
3661 975		0000	3667 561		0000 N
3662 096	N <sub>1</sub>	3	3667 741		0000 N
3662 195		0000	3667 887		000
3662 308	Co	1	3668 014		0000
3662 378	Li	5	3668 133	Fe	4
3662 502		0000	3668 354	Fe, N <sub>1</sub>	3
3662 608		0000	3668 491		0000 N
3662 762		0000 N	3668 597	Zr	00
3662 875		000	3668 634		00
3662 978	Fe, Cr	4	3668 796		00
3663 035		0000	3668 907		0000 N
3663 155		0000 N	3669 028	Fe	0
3663 208		0000 N	3669 106	T <sub>1</sub>	1
3663 346	Cr	1	3669 292	Fe	2
3663 402	Fe	3	3669 381	N <sub>1</sub>	4
3663 541		{ 3	3669 543		00 N
3663 596	Fe	{ 3	3669 666	Fe	4
3663 735		0000 N	3669 823		1
3663 835		0000 N	3669 976	Mn	0000 N
3663 968		0000 Nd?	3670 168	Co	3
3664 104	Fe	2	3670 240	Fe	2
3664 234	N <sub>1</sub>	5 d?	3670 356		0000
3664 348		000	3670 446		0000
3664 375		0000	3670 566	N <sub>1</sub>	5
3664 548		0000 N	3670 678	Mn	0 N
3664 677	Fe	3	3670 786		0000 N

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3670 860		00 N	3677 231		0000
3670 953	Fe	4	3677 308		0000
3671 046		0000 N	3677 457	Fe	4
3671 226		0000 N	3677 598	Fe	3
3671 358		000	3677 650		3
3671 412	Zr	0	3677 764	Fe	5
3671 506		0000	3677 831		3
3671 660	Fe, Pb	0	3677 991		3
3671 819	Ti	3	3678 045		2
3671 993		0000	3678 236		000 N
3672 083		0000	3678 370		1 Nd?
3672 260		000	3678 491		0000
3672 452		0000	3678 591		0000
3672 601		000	3678 718		0000
3672 742		0000	3678 864		0000
3672 851	Fe	3	3679 002	Fe	4
3672 939		0000	3679 139	Fe	2
3673 049		0000	3679 248		000 N
3673 182		0000	3679 488	Fe	1
3673 226	Fe	3	3679 575		0000
3673 362		0 N	3679 675	Fe	1
3673 562		000	3679 821		2
3673 679		0000	3679 947		0 N
3673 819		00	3680 069 s	Fe	9
3673 909		0000	3680 137		0 N
3674 025	Fe	2	3680 261		0 N
3674 198	Fe	4	3680 347		0000 N
3674 287	Ni	4	3680 525		2
3674 452		0000	3680 641		0000
3674 550	Fe	2	3680 801		3
3674 699		0000	3680 937	Fe	4
3674 865	Zr	1	3681 081		3
3674 909	Fe	2	3681 254		0000
3675 059		0000	3681 368	Fe	2
3675 135		0000	3681 501		0000
3675 255		0000 N	3681 604		0000
3675 430		1	3681 787	Fe	3
3675 585		00	3682 021	Fe	0
3675 692		0000	3682 161	Mn	000
3675 825	V	1	3682 310		2
3675 902		0	3682 382	Fe	5
3676 018		0000	3682 661		00 N
3676 112		000	3682 807		0 N
3676 291		0000	3683 021		000 N
3676 457	Fe, Cr	6	3683 182	Co	3
3676 698	Co	2	3683 229	Fe V	4
3676 836		0000	3683 514		0000
3676 950		0000	3683 617	Pb?	0000
3677 016	Fe	3	3683 761		2
3677 098		0000	3683 893		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3684 020		0000	3690 019	Fe	1
3684 106		0000	3690 053	Ti	2
3684 258 s	Fe	7 d?	3690 205		0000
3684 360		0000	3690 420	V Pd	1
3684 460		0000 N	3690 599	Fe	2
3684 600	Co	000 N	3690 732		0000
3684 680	Mn	000 N	3690 870	Co Fe	4
3684 858		0000 N	3690 999		0000
3685 000		0000 N	3691 112		0000 N
3685 140		000 N	3691 315		000 N
3685 339	Ti	10 d?	3691 452	Fe, Mn	2
3685 665	Mn, Cr	1	3691 534		0000
3685 810		0000	3691 674		0000
3685 913		0000	3691 824		0000
3686 026		0000	3691 954		0000
3686 141	Ti Fe	6	3692 101		0000
3686 246		0000	3692 251		0000
3686 326		0000	3692 364	V	1
3686 399	Fe, V	3	3692 498		0000
3686 520		0000	3692 578		0000
3686 611		0000	3692 708		0000
3686 813		000	3692 790	Fe	2
3686 926	Cr	1	3692 954	Mn	000 N
3687 010		000	3693 024		0000
3687 083		0000	3693 170	Fe	3
3687 234	Fe	3	3693 258	Co	1
3687 380	Cr	1	3693 384		0000
3687 473		1	3693 504		000
3687 610 s	Fe	6	3693 616	Co	1
3687 690	Cr?	000	3693 804	Mn	0
3687 800	Fe	4	3693 921		0
3687 899		0000	3694 077	Ni	2
3688 005		0000	3694 164	Fe	4
3688 125		0000	3694 344		3
3688 210	V	1	3694 576	* La	1
3688 312		2	3694 791		0000
3688 425		0000	3694 954		000
3688 558	Ni	4	3695 041		0000
3688 617	Fe	3	3695 194 s	Fe	5
3688 819		0000	3695 344		0000 N
3688 943		2	3695 479	V	0
3689 013	Fe	1	3695 658	Fe, Mn	1
3689 141		1	3695 789		2
3689 219	Fe	1	3696 006	Fe, V	1
3689 345		0000 N	3696 175	Fe	0
3689 459		000	3696 290		0000 N
3689 513		3	3696 433		0
3689 614	Fe	6	3696 520		0
3689 769		0000	3696 660		000
3689 839		0000	3696 707	Mn	0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3696 800	Mn	0	3703 242		000
3696 890		000	3703 369		000 N
3696 949	I <sub>1</sub>	00	3703 586		000
3697 047	Fe, Ni	1	3703 683	Fe-V	{ 4
3697 243		000 N	3703 729		{ 3
3697 397		000 N	3703 834	Fe	3
3697 567	Fe	5	3703 962	Fe	2
3697 677		3	3704 176		{ 2
3697 883		000	3704 221	Co	{ 3
3698 007		000	3704 341		000
3698 153		1 N	3704 435		00
3698 303	Ti, Zr	2	3704 485	Ti	0
3698 463		000 N	3704 603	Fe	4
3698 613		00 N	3704 842	V	1
3698 744	Fe	4	3704 935		000
3698 830		00	3705 051		000
3698 940		000	3705 171	V	0
3699 023		000	3705 251		000
3699 153	Co	00	3705 401		00 N
3699 283	Fe	3	3705 561		00 N
3699 413		000 N	3705 708 s	Fe	9
3699 533		000	3705 849		2
3699 710		000	3705 968		000 N
3699 877		000	3706 075		00
3699 962		1	3706 175	Mn- <sup>1</sup>	6 d?
3700 062		000	3706 363	Ti	3
3700 182	Ti	00	3706 475		000
3700 269		00	3706 621		000
3700 406		000	3706 701		000 N
3700 479		1	3706 835		000 N
3700 596		000	3707 021		000
3700 737		1	3707 186 s	Fe	5
3700 876		000	3707 315		000
3700 942		000	3707 468		2 N
3701 052		000	3707 600	Co	2
3701 132		000	3707 702	Ti	2
3701 234	Fe	8	3707 815		000
3701 409		000	3707 959	Fe?	5 d?
3701 512		000	3708 068	Fe	5
3701 672		000	3708 224		00
3701 749		000	3708 327		000
3701 866	Mn	0	3708 454		000 N
3702 006		000 Nd?	3708 574		000 N
3702 170	Fe	4	3708 741		1
3702 382	Co	2	3708 834	Ti, V	000
3702 409	Ti	2	3708 964	Co	1
3702 629	Fe	4	3709 170		1
3702 782		000 Nd?	3709 290		00 N
3702 962		000 Nd?	3709 389 s	Fe	8
3703 099		000 N	3709 540		0 N

Wave length	Substance	Intensity and Character	Wave-length	Substance	Intensity and Character
3709 675	Fe	1	3716 293		0000 N
3709 808	Fe	1	3716 517		00
3709 967		000	3716 591 s	Fe	7
3710 094	Ti	0	3716 677		00
3710 214		00	3716 838		0000
3710 304		000	3716 905		0000
3710 431 s	Y	3	3717 084		000 N
3710 587		00 N	3717 211		000
3710 777		00 N	3717 326		00
3710 880		000	3717 410		0000
3711 020		000 N	3717 539	Ti	2
3711 254		000	3717 695		0000 N
3711 364	Fe	4	3717 812		0000
3711 440		000	3717 872		0000
3711 552	Fe	3	3717 975		0
3711 674		000	3718 093		000 N
3711 804		000 N	3718 291		0 N
3711 923		000 N	3718 367		000
3712 079		0	3718 460		000
3712 229		00	3718 554	Fe	4
3712 319	Co	00	3718 665		0000
3712 443		000	3718 754		000 N
3712 539		000	3718 845		0000
3712 666		000	3718 978		0000
3712 856		000	3719 070	Mn, Pd	1
3712 906		000	3719 168		0000
3713 037		{ 2	3719 332		0000 N
3713 087	Cl	{ 3	3719 405		0000
3713 239		000	3719 545		0000 N
3713 346		000	3719 598		000 N
3713 479	Ni	00	3719 683		000 N
3713 693		000 N	3719 796 <sup>1</sup>		0 N
3713 853	Ti	0	3719 905		0000 N
3713 973		000	3720 084 s	Fe	40
3714 109		000 N	3720 184		0000
3714 296		000 N	3720 305		0 N
3714 359		000 N	3720 400		000 N
3714 546		000	3720 544		00 Nd?
3714 706		000	3720 704		0000Nd?
3714 813		000	3720 832		0000 N
3714 926	Zr	0	3720 930		0000
3715 069		000	3721 048		0000
3715 179		000	3721 171		0000
3715 319		2	3721 212		0000
3715 536		0000	3721 326		2
3715 615	Mn?	4	3721 418	Fe	3
3715 853		0000 N	3721 540	Fe	2
3715 938		0000	3721 647	Fe	2
3716 054	Fe	3	3721 779	Ti	4 d?
3716 172		0000			

<sup>1</sup>This line is variable, though not an atmospheric line





PRELIMINARY TABLE OF SOLAR SPECTRUM  
WAVE-LENGTHS

II



PRELIMINARY TABLE  
.  
OF  
SOLAR SPECTRUM WAVE-LENGTHS

BY  
HENRY A ROWLAND

PART II

CHICAGO  
*The University of Chicago Press*  
1898

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3722 071	Fe	3	3729 096	Ni	1 d?
3722 174		2	3729 214	C?	000 N
3722 280		00	3729 481		0
3722 377		1	3729 666		00
3722 518		0 N	3729 865		000
3722 639	Ni	3	3729 952	Ti	3
(3722 692) } s		10	3730 154		00
3722 729	Ti-Fe	6	3730 283		000
3722 899		0	3730 450		1
3722 987		000	3730 534	Fe	3
3723 319		000	3730 625	Co	2
3723 425		00	3730 732		00
3723 533		00	3730 898	Ni	1
3723 651		00	3730 950	Cr	1
3723 750		1	3731 093	Fe	3
3723 827		00	3731 301		00
3723 985		0	3731 403	Co-Zr	0
3724 053		00	3731 523	Fe	3
3724 233	Ti	1	3731 763		00
3724 399		000	3731 869		00
3724 526	Fe	6	3731 956	Mn	000
3724 716	Ti	1	3732 072		0
3724 884		00	3732 177	Cr	2
3724 970	Ni	1	3732 284		00
3725 090		0 N d?	3732 356		000
3725 300	Ti	1	3732 545 s	Ti-Fe Co	6
3725 447		0	3732 776	C-	0 N d?
3725 638		3	3732 894		2
3725 806		00	3733 028		000
3725 978		000	3733 128		000
3726 164		0	3733 222		000
3726 206		00	3733 338		1
3726 558		000 N d?	3733 469 s	Fe-	7 d?
3726 806	Co	0	3733 635	Co	1 N
3726 983		00	3733 798		000
3727 061	Fe Mn	4 d?	3733 910		00
3727 167		0	3733 984		000
3727 244	Fe	3	3734 160		00 N
3727 488		1	3734 278	Co	1
3727 590		0	3734 428		000
3727 672		1	3734 608		00 N
3727 778 } s	Fe	4 } d	3734 679		1
3727 826 } s		1 }	3734 807		0 N
3727 965		2	3735 014 s	Fe	40
3728 183		1	3735 135		00
3728 278		00	3735 261		0 N
3728 474		0 N	3735 387		000
3728 544		00	3735 485	Fe	4
3728 813	Ti-Fe	2	3735 587		000
3729 004	Mn	00	3735 694		000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3735 843	Co	o N d?	3742 286	C?	1
3736 041		1	3742 418		00
3736 107		0	3742 707		2
3736 187		00	3742 763	Fe	3
3736 321		000	3743 086	Cr	1
3736 434		000	3743 269	Fe	00
3736 619		00	3743 358		0
3736 734		000	3743 508 s		0
3736 854		000	3743 626		2
3736 958 s	Ni	3	3743 726	Cr	1
3737 059 s		5	3743 926	Cr	1
3737 174	Ca-Mn	00	3744 029		2
3737 281 s		30	3744 138	Fe	000
3737 441		1 N d?	3744 251		4
3737 718		00 N	3744 303		000
3737 900		00	3744 513	Cr	000
3738 026		00	3744 634		0
3738 128		000	3744 697		1
3738 211		00	3744 898	Ni	000
3738 281		000	3744 959		000
3738 454	Fe	3	3745 190	Co	000
3738 466		6 } d	3745 279		000
3738 505		2 }	3745 371		00
3738 652		1	3745 491		2
3738 773		000	3745 617		1
3738 900		00	3745 717 s		8
3738 946		000	3745 751		1
3739 140		00	3746 058 s		6
3739 260		2	3746 191		0
3739 370	Fe	3	3746 287	Ni	000
3739 467	Ni	1	3746 387		1
3739 674	Fe	3	3746 511		00
3739 926	Ni	1	3746 618	Fe	2
3740 085	Bi?	000	3746 717		1
3740 205	Fe	2	3746 864	Mn	00
3740 386	Fe	3	3747 065 }		3 }
3740 477		0	3747 147 } s	Fe	2 }
3740 605		0000	3747 369		0
3740 672		0000	3747 492	Fe	00
3740 952		0000	3747 694		1
3741 025		0000	3747 864		000
3741 205	Li	4	3747 965		00
3741 339		00	3748 144	Ti	1
3741 453		0	3748 232		0 N
3741 619		1	3748 408 s	Ti?	10
3741 701	Ti	0	3748 549		0
3741 791		4	3748 650	Fe	1
3741 973		000	3748 749		0
3742 043	C	00	3748 821		1
3742 219	Fe	1	3748 943		000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3749 049	Fe	0	3755 863		00
3749 110	Cr	2	3755 964		00
3749 195	Ni	1	3756 080		000
3749 388		0 N	3756 213 s	Fe	3
3749 509		00 N	3756 405	C?	00
3749 631 s	re	20	3756 480	C?	00
3749 764		0	3756 705	Mn	000
3749 884		000	3756 791	C	00
3749 994	C?	00	3757 081	Fe	4
3750 082	Co	0	3757 212		000
3750 283	C?	000	3757 304	Cl	1
3750 349	C?	0000 } N	3757 444	C?	0
3750 448		1	3757 508	C?	00
3750 648		000 N	3757 597	Fe	2
3750 823		1	3757 824	Cl 11	4
3750 916	Mn	00	3757 950		00 N
3751 015		2	3758 099		0
3751 136		000	3758 173		0
3751 234	Fe	1	3758 269		00
3751 367		0 N	3758 375 s	Fe	15
3751 592		00 N	3758 456		0
3751 735	Co	1	3758 577		0
3751 802	Zi	00	3758 736		0 N
3751 967	Fe	1	3758 863		00 N
3752 055		000	3758 967		00 N
3752 334	C	000	3759 096		0 N
3752 408	C	000	3759 215	Zr	1
3752 556	Fe	3	3759 297	La Fe	2
3752 648		000	3759 447	Ti	12d?
3752 830		00	3759 613		0
3753 003	Ti	4	3759 725		1
3753 134		1	3759 829		00
3753 282	Fe	2	3759 940		00
3753 482		1	3760 032	C?	000
3753 667		000	3760 196	Fe	5
3753 732	Fe Ti	6	3760 364		1
3753 893		00	3760 531	C?	00 N
3754 009		000	3760 679	Fe	4
3754 265		000	3760 844		00
3754 367	C	00	3761 070	C	00
3754 481	Co C	00 N	3761 206		1
3754 647 } s		3 }	3761 464	Ti	7
3754 719 } s		1 }	3761 568	Fe	2
3754 866		000	3761 695	C	000
3755 015		00 N	3761 830	C-	1 N
3755 147		000	3762 012	li	3
3755 275		0	3762 349		2
3755 421		00	3762 448	C-	1
3755 593	Co	1 N	3762 495	C-	1
3755 714		00	3762 616		000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3762 758	C	I	3770 132 s	Fe	4
3762 895		ooo	3770 308	C	oo
3763 008		oo N	3770 446	C-Fe	2
3763 147		2	3770 553		2
3763 313		ooo N	3770 671		ooo
3763 426		oooo	3770 739		1
3763 514		ooo	3770 859		o N
3763 614		oo	3770 992		ooo
3763 709		I	3771 116		2
3763 945 s		10	3771 258		oo
3764 117	Fe	o N	3771 418	C	ooo
3764 251		I	3771 471 *	C	oo
3764 359		I	3771 636		1
3764 422		oo	3771 798	Fe-C	2
3764 522		oo N	3771 956	C	oo
3764 727		oo	3772 111		ooo
3764 787		oo	3772 250	C	o N
3764 986		oo	3772 330	C	oo
3765 059		ooo	3772 524		ooo
3765 194		oo	3772 673	Ni	2
3765 441		o	3772 730		1
3765 689	Fe	6	3772 918		ooo
3765 847	Fe	1	3773 070	C	o N d?
3766 234	Fe	2	3773 345	C	oo N
3766 377	C	oo	3773 503		1
3766 460	C	ooo N	3773 609	C	oo
3766 594	C	oo	3773 695	C	oo
3766 801	Fe	3	3773 803	Fe	3
3766 955	Fe	1	3774 020		oo
3767 105		I	3774 170	C	oo
3767 218		o	3774 247	C	oo
3767 341 s	Fe	8	3774 357		oooo
3767 493		I N	3774 473 s	Y	3
3767 574		o	3774 650	C	ooo
3767 682	C	oo	3774 791	Fe-C	1
3767 787	Mn	o	3774 971	Fe	4
3767 842		oo	3775 137		ooo
3768 034		oo	3775 342	C	oo
3768 173	Fe	3	3775 431	C	oo
3768 232	C	ooo	3775 562		ooo
3768 385	C Cr-Fe C	2	3775 717	Ni	7
3768 544		o	3775 849	Tl	ooo
3768 799		o	3775 997		1
3768 871	Cr	1	3776 090	C	oo
3769 157		o N	3776 198	Ti	2
3769 454		oo N	3776 337	C	o N
3769 603		3	3776 473		ooo N
3769 792		ooo	3776 600	Fe	3
3769 861		oo	3776 698	Mn	1
3769 752	C	oo	3776 830		ooo

\* Haze, which is perhaps due to Hydrogen

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3776 977		000 N	3783 224		000
3777 057		000	3783 328		00
3777 210	Fe C	2	3783 483		2
3777 370		000	3783 601	C	00
3777 470		1	3783 674 s	Ni	6
3777 593	Fe	3	3783 954	C	00
3777 701	C	000	3784 035	C	00
3777 809	C	00	3784 391		0
3777 897	C	00	3784 511	C	00
3777 982	C	0	3784 641	C	0
3778 075	C	0	3784 814		000 N
3778 203	Ni	2	3784 965		000 N
3778 301		0	3785 152		000
3778 463	Fe	3	3785 223		000
3778 652	Fe	2	3785 373		0
3778 841	V Fe C	3	3785 457	C	0
3778 939	C	1	3785 539	C	0
3779 049		000	3785 641	C	00
3779 165		00	3785 719	C	00
3779 236		0000	3785 846	Fe	1
3779 343	C	1	3785 929		1
3779 451	C	00	3786 092	Fe	3
3779 569	Fe	4	3786 181	Li	1
3779 657	Fe	2	3786 314	Fe	4 d
3779 713		0	3786 468		1
3779 871	C	0	3786 587		1
3779 989	C	0	3786 661		0
3780 083		000	3786 820	Fe	5
3780 223	C	000	3786 983		00
3780 363	C	000	3787 104		000
3780 564	C	00	3787 240	Ci	000
3780 654	C	00	3787 304	Fe C	1
3780 842 s		3	3787 379	C	0
3780 994	C	00	3787 558		000
3781 128		000 Nd?	3787 620		000
3781 330 s	Fe	3	3787 713		00
3781 460		00	3787 852		00 N
3781 655		00	3787 922		0
3781 754	C	1	3788 046 s	Fe	0
3781 818	C	00	3788 180		00
3781 935		000	3788 283		00
3782 078	Fe	2	3788 353		000
3782 258	Li Fe	1	3788 574	C	0
3782 354	C	0	3788 666	C	00
3782 455	C	00	3788 839		2
3782 592	Fe	2	3788 953	C	0
3782 755	Fe	1	3788 999	Cr	1
3782 868		000	3789 110	C	0
3782 987		000	3789 186	C	0
3783 135	C	000	3789 319	Fe	3



# TABLE OF SOLAR SPECTRUM WAVE-LENGTHS

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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3789 439		0	3795 441	C	0
3789 553	Fe	1 N	3795 513	C	00
3789 637		0	3795 593		0
3789 719	Fe	1	3795 680	Fe	1
3789 867		0	3795 880	C	00
3789 991		1	3795 952	C	00
3790 059		000	3796 040		0
3790 238	Fe	5	3796 154		0
3790 362	Mn	2 N	3796 247	C	0
3790 471	V?	00	3796 329	C	0
3790 585	C	0	3796 449	C?	00
3790 629	Cl C	1	3796 531		0
3790 793		1	3796 635		0
3790 910	Fe-C	2	3796 943		1
3790 972	La-Ca	1	3797 032	C	2
3791 132		000	3797 115	C	00
3791 246	C	0	3797 205	C	000
3791 332	C	000	3797 283	Cl C	0
3791 517	Cr C	1	3797 387	C	00
3791 645	Fe-C	2	3797 597		00
3791 885		1	3797 659	Fe	5
3792 041		000 N	3797 860	Cl	1
3792 216	C	00	3797 991	C	0
3792 294	Fe Cr C	3	3798 093	Fe C	2
3792 482	Ni	1	3798 224		00
3792 702	C	0	3798 306		000
3792 788	C	0	3798 396	Mo	0
3792 824		2	3798 486		000
3792 969	Fe-C	2	3798 655	Fe	6
3793 069	C	000	3798 791	C	0
3793 128		000	3798 912		000
3793 262		000 N	3799 047		0
3793 429	Cr	1	3799 159		000
3793 495		1	3799 272	C	00
3793 622	Fe	2	3799 386	Mn C	1 Nd'
3793 745	Ni	4	3799 486		00
3793 846	C	000	3799 586		0
3793 921	C	00	3799 693	Fe	7
3794 016 s	Fe	2	3799 818	C	0
3794 107		000	3799 934	V	1
3794 225		000	3800 046		0
3794 313		000	3800 174	C	0
3794 485	Fe-C	4	3800 256	C	0
3794 555	C	0	3800 457	C?	0 N
3794 679		0	3800 683	Mn	1
3794 753	Cr	0	3800 766		0
3794 909	La	1	3800 877		00
3795 032	V	1 N	3800 992		0
3795 147 s	Fe	8	3801 163	Sn?	000
3795 292		1 N	3801 251		0

\* Haze which is perhaps due to Hydrogen

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3801 331		0	3807 293	Ni	6
3801 439	C	0	3807 425		00
3801 511	G	1	3807 539		00
3801 679	-C	0 N d?	3807 681	Fe	6
3801 820	Fe	3	3807 831	C	00
3801 953	Fe	2	3807 914		000
3802 051	Mn	00	3808 076	Cl C	1
3802 133		2	3808 223	Co	0
3802 271		00	3808 274	11 Ni C	1
3802 424	Fe	2	3808 423	Fe	1
3802 614		00	3808 659	V	0
3802 725		000	3808 770		000
3802 870	C	0	3808 873	Fe	3
3802 952	C	0	3809 189	C	1
3803 097		0	3809 305	C	0
3803 141	C	0	3809 552	C	00
3803 228	C	1	3809 633	Mn C	00
3803 317	C	00	3809 724	Mn	4
3803 398		1	3809 834	Mn C	0
3803 618	V?	0	3809 894	C	0
3803 711		00	3810 061	C	00
3803 816		00	3810 174		00 d?
3803 910		000	3810 434		00 d?
3804 044	C	00	3810 681	C	0
3804 151 s	Fe	3	3810 761	C	0
3804 237	C	00	3810 854	C	000
3804 317	C	00	3810 901	Fe C	3
3804 424		0	3811 047		0
3804 484		000	3811 181	-C	1
3804 621		00 N	3811 317		000
3804 752	-C	1	3811 443	-C	1
3804 836	C	1	3811 525	C	0
3804 934	Fe-Cr C	2	3811 667		000 N
3805 070		00	3811 787		000 N
3805 256	C	00	3811 945	Fe	2
3805 337	C	00	3812 033		2
3805 486 s	Fe	6	3812 126	C	0
3805 589	C	00	3812 205	C	0
3805 669	C	00	3812 340	C	000
3805 884		0 N	3812 389		00
3805 989		00	3812 589		000
3806 103		000	3812 733		000
3806 255	C	0	3812 813		000
3806 357	Fe C	2	3813 000		0 N
3806 511	C	0	3813 100	Fe	5
3806 586	C	0	3813 219	Fe	2
3806 711		00	3813 405	C	0
3806 865	Mn Fe	8 d?	3813 537	C	2
3807 012	V Mn C	0	3813 637	V C	0
3807 148		000	3813 781	Fe	2

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3814 034	Fe	2 { d	3819 938	C?	{ 00
3814 070		1 { d	3820 042		0 { d
3814 154		0	3820 102	C	0 { d
3814 264		0	3820 197		00 N
3814 386		000	3820 337		0 N
3814 500	C	00	3820 444		0 N
3814 671	Fe C	4 { d	3820 586 s	Fe C	{ 25
(3814 698)		8 { d	3820 702	C	1
3814 738	C	3 { d	3820 797	C?	0
3814 796	C	1	3820 889	C	1
3815 038	C	0	3820 950	C	0
3815 222		00 N	3821 017		0
3815 352		00 N	3821 130		00
3815 462		1	3821 328 s	Fe	4
3815 572	Cl	1	3821 636		00
3815 759		0 N	3821 725		00
3815 987 s	Fe	15 { d	3821 866	C	1 N
3816 252	C?	0 N	3821 981	Fe	4
3816 332	C?	0	3822 077	Li	0
3816 490	Fe-Co	3 { d	3822 157	V	0
3816 610	Co	1	3822 250		000
3816 779	C	00 N	3822 406	C	0
3816 887	Mn	1	3822 470	C	0
3816 998		0000	3822 557		000
3817 059		1	3822 785		00
3817 114		000	3822 924		000
3817 198	C	00	3822 996	V	1 d
3817 290	C	000	3823 092	C?	00
3817 523	Co Li C	0	3823 163		0
3817 602		00	3823 228	C	0
3817 725		00	3823 352		0
3817 786	Fe C	3 { d	3823 493		00 N
3817 877	C	0	3823 653 s	Mn Cl	4
3817 985	Li-Cl-C	0	3823 893	C	0
3818 080		000	3823 953	C	0
3818 225		000	3824 028	Mn	1
3818 337	C	00	3824 139	C?	00
3818 378	V-C	1	3824 216	Fe	1
3818 487		1	3824 373		000
3818 613	Cl	0	3824 441		{ 2
3818 759	C	1	3824 591	Fe	6
3818 891	C?	000	3824 711		1
3819 031		000	3824 780		000
3819 197	C	1 N d	3824 887		00
3819 346	C	1	3824 936		0
3819 412	C	1	3825 057		1
3819 521	C	00	3825 183		000
3819 637		2	3825 256		00
3819 715	Cl	0	3825 373	C	0
3819 829	C	1 N d	3825 448	C	0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3825 543		2	3831 334		00 Nd?
3825 736		1 N	3831 517	-C	00 N
3825 820		1 N	3831 657		000
3826 027 s	Fe	20	3831 837	N <sub>1</sub>	6
3826 163		0 N	3832 025	C	0
3826 229		0	3832 171		0
3826 343	C?	0	3832 303		0
3826 449	C?	0	3832 450 s	Mg	15
3826 555		1	3832 647	C	0
3826 636		000	3832 790		0
3826 761		1 N	3832 890		000
3826 843	C	0	3833 026		3 N
3826 905	C	00	3833 156	C	0
3826 988	C	2	3833 221	C-	1
3827 096	C	0	3833 348		0
3827 220		0	3833 458	Fe	4
3827 348		00	3833 628		000 N
3827 435		1	3833 744	C	0
3827 519	C	0	3833 836		0
3827 622		000	3833 916	C	0
3827 714		2	3834 006	Mn C	3
3827 828		1 N	3834 096		000
3827 980 s	Fe	8	3834 189		0 N
3828 155		1 N	3834 364	Fe	10
3828 296	Li C	1	3834 506	Mn	4
3828 360	C	0	3834 614		0
3828 539		00	3834 609	C	0
3828 646	V	0	3834 762	C	000
3828 702		0	3834 869		0
3828 795		000	3834 978		00 N
3828 971		00	3835 022		000
3829 108		000	3835 176		00 N
3829 195		000	3835 298	C	0
3829 284	Fe	1	3835 342	C	0
3829 386		00	3835 509	C	1 d?
3829 501 s	Mg	10	3835 689	C	0 N d?
3829 617	Ti-C	2	3835 862	-C	000 d
3829 728	Fe C	0	3836 116		000
3829 822	Li-C	1	3836 229 s		2
3829 909		1	3836 337	C	000
3830 037		000	3836 476	Fe	3
3830 211		0	3836 639 } s	C	1 } d
3830 447		000	3836 689 }	C	1 }
3830 513		0	3836 808		000
3830 627		0	3836 905		1
3830 745	C	0	3837 059		1
3830 801	C	0	3837 277		2
3830 896	Fe	2	3837 404		000
3831 002	Fe	2	3837 559	C	0 N d?
3831 174	C-	3 d	3837 768	C	1 d?

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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3837 961	C	0	3844 714		0
3838 035	C	0	3844 861		00 N
3838 188		0 N	3845 023		0
3838 345		1 N	3845 149	C	1
3838 435 s	Mg C	25	3845 310	Fe	3
3838 675		0 N	3845 358		1
3838 888	C	1 N d?	3845 461	C	000
3839 135		0	3845 606	Co-C	8 d?
3839 275	C	1	3845 729		000
3839 405	Fe	3	3845 837		1
3839 582		0	3845 949	C	00 N d?
3839 762	Fe	2	3846 131	C	2
3839 922	Mn-C	2	3846 421		1
3839 987	C	0	3846 554	Fe	2
3840 067		00	3846 666		00
3840 239	C?	0	3846 777	C	1
3840 340	Mn	0	3846 814	C	1
3840 440	V	0 N	3846 943	Fe	5
3840 580 s	Fe C	8	3847 087	C	1
3840 720		0 N	3847 121	C	00
3840 893	V	1 N	3847 261		000 N
3841 034	C	0 N d?	3847 394	C	00 N
3841 195	Fe-Mn	10	3847 477	V	00
3841 327		0	3847 567		00
3841 420	Cr	1	3847 654		000
3841 486		00	3847 827		000
3841 595	Co	0	3847 961	C	1
3841 720		000 N	3848 006	C	1
3841 862	C	2 d?	3848 100	C	0
3841 959	C	0	3848 186		00
3842 082	C	0	3848 249		00
3842 191	Co	3	3848 329	C	00
3842 354	-C?	0 d?	3848 432		2
3842 500		000	3848 580		000
3842 587	C	00	3848 667		00
3842 779	C	0	3848 745		00
3842 904		000	3848 840		00
3843 038		1	3848 979	C	1 N
3843 127	C	3	3849 140	La C	3 d?
3843 195	Fe C	2	3849 248		000
3843 404 s	Fe	4	3849 400		000
3843 600	C	0 N	3849 501	C?	1 N
3843 762		000	3849 675		1
3843 854		2 N	3849 886	C	0 N
3843 962		000	3850 013		0
3844 135	Mn-C	2	3850 118	Fe	10
3844 167		0000	3850 300	C	1 N d?
3844 267		000	3850 440		00
3844 378	Ar, He C	4 d?	3850 536		00
3844 587	V	0	3850 626		0

Wave-length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3850 700		00	3856 674		0
3850 781	C?	0	3856 802	C?	2 N
3850 962	Fe	4	3856 955		000
3851 098	Co?	0	3857 063	C?	0
3851 220		000	3857 135	C?	000
3851 306		00	3857 215	C?	000
3851 427	C	2 N d?	3857 288	C?	1
3851 580		000	3857 473	C	0
3851 672	C	0	3857 580	C	00
3851 733	C	00	3857 805	C?	6 d?
3851 815	C	00	3857 955	C?	0
3851 895		00	3858 033	C?	1
3851 993	Co C	00	3858 146	C?	00
3852 132		000	3858 262		1 N
3852 245	C	00	3858 442	N <sub>1</sub>	7
3852 347	C-	1	3858 606	C	0
3852 541	C?	2 N d?	3858 642	C	000
3852 714	Fe	4	3858 722	C	0
3852 845	C	00	3858 822	C	2 N
3852 899	C	000	3859 000		1 N
3853 045	C	00	3859 052	C?	1
3853 184		00	3859 128	C	00
3853 233	C	1 d?	3859 246	C?	00
3853 477	-C	0 N	3859 355	Fe	3
3853 620	C	2 d?	3859 415	C	000
3853 805	C	00	3859 535		000
3853 872	C-	0	3859 568	C?	0
3853 967	C	000	3859 788	C-N <sub>1</sub>	0
3854 040	C	00	3859 876	C	00
3854 191	C	0	3860 055 s	Fe C	20
3854 343		0	3860 227	C-	0 N
3854 401		00	3860 354	C?	0 N
3854 507		2	3860 427		00
3854 707	C	2 N d?	3860 566	C	0
3854 808	C	0	3860 630	C	0
3854 869	C	0	3860 767	C-N <sub>1</sub>	3 N
3854 989	C	1	3860 863	C	000
3855 088	C	00	3860 903	C	0
3855 259	C?	00	3861 067	C	00
3855 450	V	2	3861 158	C-	0
3855 547		1	3861 158	C-Co C	4 N d?
3855 721	Fe C	1	3861 299	C-Fe	3
(3855 749)		5 } d	3861 479		00
3855 766	C	3	3861 592	C	1
3855 989	V	4	3861 681	C	2
3856 107		00	3861 734	C	2 N
3856 161		1	3861 847	C	1 N
3856 282		000	3861 978	C	1 N
3856 367		0	3862 114		000
3856 524 s	Fe	8	3862 248		000
			3862 361		

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3862 458	C	00	3867 996	C?	000
3862 541	C	000	3868 060	-C	2
3862 627	C?	2	3868 171	C	00
3862 727		1	3868 261	C	0
3862 827	C	000	3868 372	C	0
3862 897	C	00	3868 451		000
3862 962		0	3868 539	C	1
3863 041	C	00	3868 625	C	00
3863 113	C	00	3868 700	C	0
3863 201	<i>for 113, 115</i>	1	3868 785	C	00
3863 341		000 N	3868 873	C	1
3863 533	C	3 N	3868 941	C	0
3863 655	C	00	3869 179	C	0
3863,734	C	00	3869 305	C	1
3863 835	C-	1	3869 444	C	0 N d?
3863 888	Fe	3	3869 533	C-	1
3864 006		0	3869 692	Fe C	3
3864 113	C	0	3869 745	C	1
3864 246	Mo C	1	3869 805	C	1
3864 438 <sup>s</sup>	C	3	3869 960	C	00
3864 626	C	1	3870 053	C-Co	1 N
3864 720	C	00	3870 204	C	0
3864 802	C	00	3870 289	C-	1 N
3865 005	V	3 N d?	3870 405	C?	00
3865 134	C	0	3870 493	C?	0
3865 213	C	000	3870 615	C-	1
3865 282	C?	3	3870 685	C	0 N
3865 454	C	0	3870 797	C	0 } d
3865 554	C	0	3870 848	C	00 }
3865 674	Fe-C	7	3870 932	C	0
3865 793	C	0	3871 018	C	1
3866 046	C?	000	3871 145	C	0
3866 122	C?	3 N d?	3871 259	C	0
3866 238	C	00	3871 356	C-	1
3866 306	C	00	3871 527 <sup>s</sup>	C	2 d?
3866 380	C	00	3871 693	C	0
3866 526	C	00	3871 785		00
3866 577	C	1	3871 963	Fe	2
3866 692	C	0	3872 035		0
3866 854		0	3872 202	C-	1 N
3866 960	C-	2	3872 312	C	0
3867 118	C	0	3872 405	C-	1 N
3867 205	C	0	3872 639	Fe	6
3867 356	Fe-C	3	3872 859	C	1 N d?
3867 449	C	0	3872 969		00
3867 520	C	0	3873 065	-Co	2
3867 573		0	3873 224	Co	2
3867 758	C-V	1	3873 267		2
3867 791	C	0	3873 333		00
3867 906	C-	1	3873 427		0

\*Beginning of the second head of "Cyanogen band"

Wave-length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3873 504	C	0	3879 458	C	0
3873 636	C	0	3879 578	C	000
3873 706	C-	1	3879 716	C	1
3873 903	Fe	4	3879 796	C	0
3874 091	Co C	4	3879 851 }	C	0
3874 191		1	3879 986	C	00
3874 258	C	00	3880 105 }	C	1
3874 328	C	0	3880 175 }	C	0
3874 491		000 Nd?	3880 235	C	0
3874 651		2	3880 328	C	0
3874 708	-C	0	3880 393		0000
3874 861	C	1	3880 465 }	C	1
3874 911	C	2	3880 532 }	C	2
3875 220 s	V	2	3880 596 }	C	1
3875 425	Ti C	2 Nd?	3880 684	C	000
3875 513	C	1	3880 815 }	C	1
3875 681		00 N	3880 931 }	C	1
3875 793		00	3881 038	C	000
3875 920	C-	2	3881 140	C	1
3876 019	C	0	3881 254	C	1
3876 083	C	0	3881 346	C	0
3876 194	Fe	5	3881 445 }	C	2
3876 448	C	0	3881 543 }	C	1
3876 556 }	C	0	3881 628	C	000
3876 622 }	C	0	3881 729 }	C	1
3876 702		000	3881 825 }	C	1
3876 815	Fe	1	3882 011	C-Co	2
3876 981	Co-C	4	3882 118	C	1
3877 121	C	4 Nd?	3882 224	C	1
3877 232		00	3882 309	C	1
3877 337		1 N	3882 439	C-	2
3877 481	C	1	3882 530	C	1
3877 587 }	C	0	3882 650	C	1
3877 646 }	C	0	3882 733	C	1
3877 745		00	3882 828	C	1
3877 845		000	3882 893	C	1
3877 972	C	0	3882 986	C	0
3878 072	C	00	3883 033	C	1
3878 152	Fe-C	8	3883 133	C	2
3878 334		1	3883 253	C	1
3878 438	C-	2	3883 339	C	0
3878 549	C	0 d?	3883 426 }	C-	2
3878 720	Fe	7 Nd?	3883 533 }	C	1 N
3878 816	Co Fe	2	3883 568 s		
3878 884	C-Fe	2	3883 690		000
3878 975	C	0	3883 778 s	Cr	0
3879 037	C	0	3884 236		000
3879 178	C?	00 N	3884 361		00
3879 331	C	1	3884 431		0
3879 394	C	0	3884 518	Fe	2

\*First line in first head of "Cyanogen band" This line and the preceding one were measured together as a single line in the series of measurements upon which were based Rowland's Table of Standards

<sup>a</sup>Edge of "Cyanogen band"



# TABLE OF SOLAR SPECTRUM WAVE-LENGTHS

17

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3884 579		00	3891 918		0
3884 748	Ca	1	3892 069	Fe	4
3884 812	Fe	1	3892 153		000
3884 986		0	3892 373		00
3885 101		00	3892 450		0
3885 207		00	3892 590		00
3885 290	Fe	2	3892 698	Mn	2
3885 364	Fe Cr	2	3892 873		000
3885 426	Co	00	3893 033	V Fe	2
3885 657	Fe	4	3893 124		1
3885 797		00	3893 213		1
3885 895		1	3893 352		000
3886 005		0	3893 451		2
3886 073		0	3893 542	Fe	4
3886 205		00 N	3893 600		0
3886 295		00 Nd?	3893 743		000
3886 434 s	Fe	15	3893 932		000
3886 568	V	0	3894 057	Fe	2
3886 942	Cr	3	3894 165	Cr	3
3887 080		00	(3894 211)		8 } d
3887 196	Fe	7	3894 241	Co	5
3887 512		000 N	3894 355		0000
3887 666		000 N	3894 511		0000
3887 870		000 N	3894 630		1 N
3888 030		00	3894 768		00
3888 179	Li	0	3894 850	Mn	0
3888 560		2	3895 119	Co	3
3888 671	Fe	5	3895 224	Ce	1
3888 863		00 N	3895 304		00
3888 971	Fe-Mn	2	3895 377	Ti	2
3889 077		0	3895 470		1
3889 245		1	3895 583	Mn	3
3889 374		1 Nd?	3895 719		0
3889 498	Mn	1 d?	3895 803	Fe	7
3889 675		00 N	3895 931		0
3889 810	Ni	2	3896 279	V?	0
3889 986		0	3896 385	Mn	00
3890 069		1	3896 500		00
3890 222		000	3896 608		1
3890 336	V	1 N	3896 671		0
3890 450		000	3896 759	Zr	0
3890 538	Fe-Zr	2	3896 917	Ce	0 N
3890 707		1 N	3897 119		000
3890 861		00	3897 210		000
3890.986	Fe	3	3897 336		000
3891 084		00	3897 482		000
3891 339		1 N	3897 596 s	Fe	2
3891 521		0	3897 785	Zr	0
3891 649		1 N	3897 915		0
3891 820		000	3898 032	Fe	3

\* Haze, which is perhaps due to Hydrogen

Wave length	Substance	Intensity and Character	Wave-length	Substance	Intensity and Character
3898 151	V	5	3905 017		I
3898 231	Fe	2	3905 146		I
3898 414		00	3905 326		2
3898 531	Mn	2	3905 497		1 N
3898 645	Ti	0	3905 660 s	Si	12
3898 911		000 N	3905 816		2 N
3899 015		0000	3905 906		1 N
3899 171	Fe	3	3906 044		3
3899 277		2	3906 169		00
3899 463		000	3906 318		000
3899 530	Mn	0	3906 438	Co	2
3899 701	Mn	0 N	3906 539		000
3899 850	Fe	8	3906 628	Fe	10
3899 963		0 N	3906 763		00
3900 361		0	3906 890	Fe	4
3900 470		000	3907 099		I
3900 549		0	3907 251		0 Nd?
3900 681	Ti Fe-Zr	5	3907 368		00
3900 797		000	3907 433		000
3900 907		000	3907 615	Fe-Sc	3 d?
3900 973		0	3907 807		I
3901 114	Ti	I	3907 910		I
3901 197		000	3908 077	Fe	5
3901 297		00	3908 203		000
3901 474		00 Nd	3908 310		0000
3901 621		00	3908 410		I
3901 735		2	3908 546		0
3901 878		000	3908 684		0
3902 002		3	3908 821		00
3902 114	Fe	I	3908 900	Cr	4
3902 241		0	3909 064		I
3902 399	V	3	3909 211		000
3902 567		1 N	3909 423		0
3902 768		2 N	3909 538		0000
3902 916		0	3909 638		00
3903 090	Fe-Cr	10	3909 802	Fe	4
3903 216		0	3909 863		000
3903 302		I	3909 976	Fe	5
3903 398		2	3910 079	Co-Ca	3 Nd?
3903 553		000	3910 211		000
3903 683		00 Nd?	3910 348		000
3903 868		000	3910 469		2
3903 991		2	3910 615		0
(3904 023)		8 } d	3910 670		2
3904 052	Fe	5	3910 802		0
3904 213	Co	0	3910 984	Fe-V	4
3904 467		00	3911 135		3
3904 613		000	3911 230		00
3904 767		0	3911 316	*Nd	0
3904 926	Ti	3	3911 444		000

\*Nd is the symbol for Neodymium

# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS II

By HENRY A. ROWLAND

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3911 554	Mn	o Nd?	3917 400		o
3911 708		ooo	3917 731	Cr	o
3911 836	Fe	1	3917 893		ooo
3911 963	Sc	2	3918 007		o N d?
3912 127	Cr?	2 N	3918 223		o N
3912 224		o	3918 396	Mn	o
3912 341	V?	o	3918 464	Fe	4
3912 445	Ni?	2	3918 563	Fe	4
3912 561		o	3918 713		o
3912 732		oo	3918 789	Fe	5
3912 935	Fe	o	3918 929		oo
3913 030		oo	3919 035		o
3913 123	Ni	2	3919 208	Fe	3
3913 282		ooo N	3919 309	Cr	3
3913 395		1	3919 499		ooo N
3913 609	Ti-Fe	5 d?	3919 708		o N d?
3913 775	Fe	4	3919 869		o
3914 153	Ce?	1 N	3919 956	Cr	o
3914 320		o	3920 114		o
3914 426	Fe?	3	3920 264	Co?	1
3914 477	Li	2	3920 410	Fe	10
3914 566		1	3920 591		o N?
3914 652	Ni?	1	3920 768	Fe	1
3914 880	Fe	o N	3920 868	Co	1 N
3915 094		o N	3920 984	Fe	2
3915 359	Fe	1	3921 105		o
3915 612	Fe, Cr	1	3921 188	Cr-Nd	3
3915 751		3	3921 326		1
3915 951	Cr-	5 d?	3921 415	Fe	1
3916 079	Zr	1	3921 563	Ti	1
3916 207	Zi-La	o N d?	3921 605	La-	4
3916 383	Cr	2	3921 855	Zr-Mn	4
3916 545		3	3922 043		o N d?
3916 661	Mn	oo	3922 159		oo
3916 745	Zr	oo	3922 223	Mn	1
3916 879 s	Fe	5	3922 560	V	1 N
3916 992		oo	3922 815	Mn	1
3917 125		o	3922 907	Co	o
3917 264	Co	2	3923 054	Fe	12 d?
3917 324	Fe	5	3923 180		1

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3923 246		0	3930 654		0
3923 375	Mn	00	3930 804		0
3923 472	Sc	0	3931 030		0
3923 641		0	3931 269	Fe	1
3923 831		00 N	3931 483		0 N
3924 065		000	3931 729	Mn?	1 N
3924 206	Mn	1	3932 039		0 N
3924 313		1	3932 161	I <sub>1</sub>	1
3924 492		00 N	3932 395		0
3924 673 s	Ti	4	3932 625		00 N
3924 791		0	3932 785	Fe	1
3924 929		00	3933 056	Fe	0
3925 153		00 N	3933 523		8 N
3925 347 s	Co, Fe?	4	3933 825 s K	Ca	1000
3925 491		000	3934 108	Co	8 N
3925 677		1	3934 174		0 N
3925 790 s	Fe	5	3934 661		0 N
3925 939		000	3934 818	Co?, Fe?	0
3926 086	Fe	{ 4	3935 358		00 N d?
(3926 123) } s			3935 463	Co, Fe	1
3926 165			3935 588	, Mn?	00
3926 320		000 N	3935 787		0 N d?
3926 465	Ti	0	3935 965	Fe	2
3926 597	Mn	2 N	3936 121	Co	2
3926 779	Cr	0	3936 507		00
3926 917		000	3936 699		0
3927 079		0 N d?	3936 912	Mn-	0 N d?
3927 269		0	3937 105		00 N d?
3927 392		000	3937 283		00 N d?
3927 484		00	3937 479 s	Fe	3
3927 585		1	3937 58c		000
3927 748		0	3937 695		00
3927 937		1 N d?	3937 972	Mn-	00 N
3928 075 s	Fe	8	3938 116		0
3928 231	Fe	2	3938 160		1
3928 357	-Cr?	2 N d?	3938 326		000
3928 485		2 N	3938 439		2
3928 636		00	3938 552		4
3928 783	Cr	3	3938 772		0
3928 904		000	3938 876		00
3929 124		000 N	3939 007		0
3929 260	Fe Co	2	3939 112		00
3929 363	Fe-La-Mn	2	3939 288		0
3929 497	Co?	1	3939 532		00 N
3929 663		0 N	3939 659		00
3929 864	Mn?	0 N d?	3939 736		00
3930 022	Ti	2	3940 026		00 N
3930 180		0 N	3940 183	Fe?	2
3930 291		000	3940 324		00
3930 450	Fe	8	3940 499		0 N d?

TABLE OF SOLAR SPECTRUM WAVE-LENGTHS 21

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3940 812		0	3947 300		00
3941 025 s	Fe, Co	5	3947 522		2
3941 190		0	3947 675	Fe	4
3941 323		1	3947 830		1
3941 424	Fe?	3	3947 918	Ti	2
3941 510		000	3948 117		000
3941 637	Cr	3	3948 246	Fe	5
3941 753		00	3948 420		1
3941 878	Co	3	3948 613		00 N
3941 997		1	3948 818	Ti	4
3942 157	Mn?	0 N	3948 925	Fe	4
3942 296	Ce?	1	3949 039 s	Ca	1
3942 380		0	3949 199	La	1
3942 510		2	3949 286	Fe	2
(3942 558) } s			3949 372		1
3942 586	Fe	3	3949 544		00
3942 747		000	3949 753		0
3942 886	Co Ce	0	3949 959		0
3942 984	Mn	0	3950 102 s	Fe	5
3943 238		2	3950 278		0
3943 322		2	3950 398		000
3943 489	Fe	3	3950 497 s	Y	2
3943 622		0 N	3950 613		0
3943 721		1	3950 938		000
3943 819		00	3951 219	Ci	1
3943 960		1	3951 311	Fe	5
3944 058		0	3951 449		00
3944 160 s	Al	15	3951 578		00
3944 319		1 N	3951 765	Y	0 N d?
3944 492		0	3951 917	Ci	0 N
3944 681		00 N	3951 978		000
3944 824		1	3952 103	Mn	2
3944 884	Fe?	2	3952 235		00
3945 033	Fe	3	3952 342	Na?	0
3945 128	Co	1	3952 465	Co	0
3945 260	Fe	3	3952 549	Cr	0
3945 358		1	3952 606"		000
3945 473	Co	3 N	3952 683		000
3945 633	Ci?	00	3952 754	Fe	4
3945 827		00 N d?	3952 850	Fe,-	3
3945 993	Mn?	1	3952 894		0
3946 101	Cr?	00	3953 043	Mn	3
3946 188	Fe	0	3953 120	Co	3
3946 340		0	3953 222		1
3946 599		00	3953 303	Fe-Cr	3
3946 693		0	3953 400		0
3946 800	Co	0	3953 550		00
3946 953		000 N	3953 641		1
3947 142	Fe	3	3953 804		000
3947 272	Co	0	3953 844		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3954 002 s	Fe	3	3961 281	Fe	3
3954 104		000	3961 422		0 N
3954 190		0 N	3961 538		1 N
3954 414		000	3961 674 s	Al	20
3954 536		00	3961 947		0
3954 680	Ni, Mn	2	3962 056		1
3954 857	Fe?	1	3962 222	Fe?	1
3954 967		000	3962 320		2
3955 157		000 N	3962 489	Fe?	2
3955 356		1	3962 534		0
3955 482	Fe	5	3962 785		00
3955 524		00	3962 861		0
3955 744		00	3962 995	Ti	3
3955 903		0	3963 108		00
3955 968		000	3963 252	Fe	3
3956 099	Fe	3	3963 369		1
3956 197		00	3963 487		00
3956 316		00	3963 576		1
3956 476	Co-Ti	4	3963 701		00
3956 603	Fe	4	3963 831	Cr	3
3956 819	Fe	6	3963 941		000
3957 030		00	3964 059		00
3957 177 s	Fe-Ca	7 d?	3964 173		0
3957 423		00	3964 326		1
3957 621		00 N	3964 416	Li	2
3957 767	Fe, Co	1	3964 541		00
3957 939		00	3964 663	Fe	3
3958 073	Co	2	3964 897	Fe?	0 N d?
3958 231		00	3965 148	Co,	0 N
3958 355	Ti, Zr	5	3965 366	Co	0
3958 474		000	3965 487		000
3958 554	Fe?	0	3965 614		000
3958 647		000	3965 655	Fe,-	2
3958 776		00	3965 750		0
3958 877	Fe	1	3965 868		1
3959 006		000	3965 980		1
3959 102		00	3966 069		2
3959 335		00	3966 212	Fe	3
3959 435		0	3966 494	Fe	0 N
3959 588		00	3966 647	Ni, Fe	2
3959 678		00	3966 778	Fe	3
3959 862		000	3966 966	Fe	1
3959 972		1	3967 194		0 N d?
3960 288		00	3967 570	Fe	2
3960 422 s	Fe	4	3967 777		0 N
3960 547		000	3968 000		0 N
3960 783		00	3968 114	Fe	1
3960 902	Cl	00	3968 350		6 N
3961 051		00	3968 625 s II	Ca	700
3961 148	Co	0	3968 854	Ca?	1 N

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3968 886		6 N	3975 197		oo Nd?
3969 073		o N	3975 350	Fe	2
3969 287	Cr, Co	o N	3975 506	Co-	1
3969 413	Fe	10	3975 662		oo Nd?
3969 544		o N	3975 831		oo Nd?
3969 642		o N	3975 985	Fe-Mn	2
3969 784	Fe		3976 097		ooo
3969 899	Cr	2	3976 230		2
3970 065	Fe?	o N	3976 325		ooo
3970 177	II?	5 N	3976 416		oo
3970 305		o N	3976 532	Fe	2
3970 419		1	3976 692	Fe	2
3970 540		2	3976 770	Fe	3
3970 631		1	3976 839	Cr	3
3970 711		ooo	3977 009	Fe	2
3970 803		o	3977 126		o
3970 979		o	3977 223	Mn	oo
3971 147		1 N	3977 337	Co	o
3971 265		ooo	3977 477		ooo
3971 402	Cl	o	3977 716		oo N
3971 475 s	Fe	5	3977 891 s	Fe	6
3971 608		ooo	3978 036		ooo
3971 751		ooo	3978 161		oo
3971 863		oo	3978 306		o
3971 969	Fe?	o	3978 485		1
3972 134		o N d?	3978 604	Fe	2
3972 313	Ni	2	3978 715		oo
3972 407		1	3978 809	Co, Cr	3
3972 558		1	3978 916		ooo
3972 598	Co	o	3979 003	Co?	o
3972 720		1	3979 152		ooo
3972 830	Cr?	oo	3979 256		oo
3973 056	Fe	1	3979 344		oo
3973 152		oo	3979 466		oo
3973 262	Co	1	3979 664	Co	4
3973 308	Co	1	3979 783	Fe	3
3973 418	Fe?	o	3979 936	Fe, Cl	o
3973 558		oo N	3980 043		oo
3973 702	Ni, Z1	3	3980 153		1
3973 796 } s	Fe	1	3980 289		oo
3973 864 }	Ca	2	3980 441		oo
3974 004	Fe?	o	3980 664		oo
3974 057		1	3980 779	Fe	1
3974 164		ooo	3980 963	not Fe part. in H	ooo
3974 310		1	3981 024		oo
3974 408		oo	3981 122	Ce	1
3974 536	Fe	3	3981 248	Fe	2
3974 637	Ni?	2	3981 376	Cl	1
3974 774	Ni	2	3981 467		ooo
3974 904	Co Fe	6 d?	3981 592		ooo

\* The Hydrogen line must be wide and diffuse, and thus probably coincides with this solar line which is of that nature.

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3981 662		00	3988 617	'La	{ 0 0 0 00 N 00 N d?
3981 762	Zr?	0	3988 659		
3981 917 s	Ti Fe	4	3988 705		
3982 142	Fe?	2	3988 812		
3982 308		00 N	3988 979		
3982 470		00 N	3989 137		3
3982 630	Ti Mn	2	3989 232		2
3982 742	Y	3	3989 404		00 N
3982 896		000	3989 592		00 N
3983 053	Mn	00	3989 753		00 N
3983 150		2 N	3989 912		00 N
3983 341		2 N	3990 011	Γ <sub>1</sub>	4
3983 503		0	3990 129	Fe	3
3983 682		1	3990 248	Cr-Mn	1
3983 811		00	3990 333		0
3983 959		0	3990 445	Co	00
3984 059	Cr	{ 3	3990 525	Fe	0
(3984 091) } s			3990 712	V	2
3984 113	Fe		4	3990 905	
3984 294	Mn	2	3991 095		000 N
3984 479	Cr	2	3991 333	Cr, Zr	00 Nd?
3984 592		00	3991 459		3
3984 707		000	3991 580		00 N
3984 806	Ce-Zr	2	3991 690	Fe	1
3984 982		00	3991 830	Co	0
3985 084		1	3991 892	Co-Cr	2
3985 213		000	3991 981		0
3985 385		0	3992 041		00
3985 463	Mn	1	3992 164		00
3985 539	Fe	5	3992 261		000
3985 745		00	3992 396		00
3985 773		00	3992 538	Fe	2
3985 939		00 N d?	3992 631		1
3986 147		00 N	3992 790		00
3986 321	Fe	3	3992 971	V-Cr	0
3986 439		0	3993 121		3 d?
3986 513		000	3993 246	Fe	00
3986 717		000	3993 451		2
3986 903 s		6	3993 616	Ba?	00 N
3986 979	Mn	1	3993 758		00 N
3987 140		1	3993 878		0
3987 244 } s	-Mn	3	3993 978		0
3987 332	Co	1	3994 092	Cr	00
3987 520		0	3994 160	Ni	1
3987 625	Mn?	0	3994 265	Fe	1
3987 755	Ti?	2	3994 416		4
3987 885		000	3994 474		000
3988 114		0	3994 612		000
3988 259		000 N	3994 660	Zr Co	00
3988 485		00 N	3994 828	Nd?	2 N
					2

\* The Lanthanum line is a compound line made up of two or three lines covering about the width of these three lines of the spectrum



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
3994 958	Ti	00	4001 387	Mn	000
3995 096		00	4001 489		000
3995 217		00	4001 595	Cr	I
3995 352		2	4001 704		00
3995 463	Co	5	4001 814	Fe	3
3995 586		00	4001 895		00
3995 769	Ba <sup>p</sup>	000	4002 086	Mn	00 N d?
3995 899	La	1 N d?	4002 227		0
3996 009		00	4002 308	Mn	00
3996 140	Fe	3	4002 547		00
3996 264		0	4002 652	Fe-Ti	0 d
3996 410		1	4002 808		0
3996 498		00	4002 948		00
3996 682	Sc	00	4003 076		2
3996 752		00	4003 230		000
3996 845		00	4003 424		00 N
3996 935		0	4003 655		00 N
3997 004		000	4003 772		00 N
3997 115	Fe	2	4003 912 s	Ce Fe-Ti	3
3997 258	Cl <sup>p</sup>	1	4004 062		00
3997 365	Mn	000	4004 168		0
3997 547	Fe	4	4004 308		00
3997 638		2	4004 412		000
3997 757		000	4004 536		00
3997 895		00 N	4004 753		00
3998 053	Co	4 d?	4004 855		000
3998 205	Fe	4	4004 982	Fe	I
3998 417		000	4005 067		I
3998 620		0	4005 202		I
3998 790	Ti	4	4005 216		I
3998 893		000	4005 308		0 N
3998 999		000	4005 408	Fe	7
3999 117	Zn, Fe	1	4005 545		I
3999 197	Ce	0	4005 632		I
3999 295		000	4005 802		000
3999 393		0	4005 856		3
3999 495	Fe <sup>p</sup>	00	4005 994		000
3999 646		000	4006 114	Ti	0
3999 818	Cr <sup>p</sup>	00	4006 168		00
3999 943		000	4006 304	Ni	I
4000 173	Fe <sup>p</sup>	0	4006 464	Fe	2
4000 296		000	4006 621		00
4000 403	Fe	2	4006 776	Fe	3
4000 521		0	4006 901		2
4000 611	Fe	2	4006 978		I
4000 729		00	4007 142		I
4000 965		0	4007 185	Mn	00
4001 119		000	4007 310		000
4001 256		0	4007 429	Fe	3
4001 315		3	4007 586		00

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4007 758	Fe	00 N d?	4014 117	Co	00 N
4007 948		00	4014 274		00 N
4008 075	Co-?	0 N	4014 420	Fe	1
4008 215	Mn Ti	0	4014 537		00
4008 322		0	4014 677	Fe	5 d?
4008 507		000	4014 827		00
4008 568		000	4014 941		000
4008 748		0	4015 086	Ce	0 N d?
4008 882		00	4015 305		0
4009 022		2	4015 416		000
4009 079	Ti	3	4015 532		0
4009 201		000	4015 628	Ti?	0
4009 291		1	4015 760		3
4009 401		000	4015 880		00
4009 567		000	4016 027		00
4009 694	Fe	1	4016 154		00
4009 807	Ti	1	4016 240		000
4009 864	Fe	3	4016 434		0
4010 057		000	4016 574 s	Fe	2
4010 134	Ni	00	4016 695	Fe	00
4010 201		000	4016 835		00
4010 327	Fe	1	4016 955	Co Cr	0
4010 434		000	4017 114		00
4010 527		00	4017 244		3
4010 641		000	4017 308	Fe	4
4010 735		3	4017 458		000
4010 797		000	4017 620	Ni?	2
4010 927	Fe	2	4017 724	Ni?	1
4011 080	Fe	2	4017 925	Ti	0
4011 221		00	4018 080		00
4011 451		00	4018 234	Mn	* { 3
4011 561	Fe	3	4018 269	Mn	
4011 693	Mn	00	4018 420	Fe	
4011 865	Fe	2	4018 534		00
4012 046		00	4018 646		00
4012 174		00	4018 840		000
4012 305	Fe	0	4018 996		00
4012 399	Nd, Zr	1	4019 087		00
4012 541	Ti	4	4019 201	Ni Ce	1
4012 631	Cr	0	4019 287		00
4012 757		00 N d?	4019 450	Co	0
4012 858		00	4019 580		000
4012 941		00	4019 747		00 N
4013 107		00	4019 987		000
4013 221		00	4020 034	Fe	000
4013 387		0	4020 171		0
4013 614		000	4020 226	Mn	1
4013 729		0	4020 341		1
4013 798	Ti-Fe	3	4020 424		2
4013 964	Fe	5	4020 547	Sc	1

\* Probably compound lines, of which there are many in the spectrum of Manganese

Wave length	Substance	Intensity and Character	Wave-length	Substance	Intensity and Character
4020 639	Fe	1	4027 539		0
4020 799		000	4027 623		00
4020 927		000	4027 822		1
4021 057	Co	3	4027 939		00
4021 238		000	4028 092		0
4021 346		000	4028 272		000
4021 493	Nd	0	4028 497	Ti	4
4021 645		000	4028 638		00
4021 769	Fe	2	4028 756		00
4021 893	li	0	4028 912	Fe-Ce	1
4022 018	Fe	5	4029 138	Zr	000
4022 199		0 N	4029 319		000
4022 371	Fe	1	4029 445		0 N
4022 401	Cr	0	4029 597		5
4022 599	Fe	0	4029 796 s	Fe-Zr	00 N
4022 685	Cu?	000	4030 026		00 N
4022 775		00	4030 198	Zr	00 N
4022 893	Fe	2	4030 339	Fe	2
4023 165	Nd	0	4030 497	Sr	0
4023 379		00 N	4030 646	Fe-Ti	5
4023 533	Co-	3	4030 796		0
4023 705	La	000	4030 878	Mn	4
4023 834	Sc	2	(4030 918) s		5
4023 979	Fe	000	4030 947	Mn	2
4024 153	Zr	1	4031 048		0
4024 247	Fe	2	4031 270	Fe	1
4024 373		000	4031 395		0
4024 479		000	4031 492		00
4024 593		00	4031 596		00
4024 726	li	3	4031 712	Fe La	2
4024 881	Fe	4	4031 865	Mn	2
4025 043		000 N	4031 942	Fe	2
4025 158	Cr	0	4032 117		00
4025 286	li-	3	4032 265		00
4025 458		000	4032 418		00
4025 579	Cr	1	4032 610	Fe	2
4025 733		000	4032 789	Fe	4
4025 826		000	4032 985		000
4025 972	Co La	2	4033 112		00
4026 079		00	4033 224 s	Fe-Mn	17 d?
4026 220		00	4033 337		1
4026 318	Cl	0	4033 425		00
4026 461		00	4033 578		000 d?
4026 583	Mn	12 N	4033 732	Mn	1
4026 691	li	1	4033 814	Mn	1
4026 919		00	4033 946		00
4027 067		00	4034 052		00
4027 189	Co	1	4034 120		00
4027 253	Cl	0	4034 245		00
4027 399	Zi	00	4034 380		1 N

\* Probably compound lines, of which there are many in the spectrum of Manganese

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4034 533	Mn Fe	I	4042 064	Cr, Nd	00
4034 644 s		<sup>16</sup> d?	4042 137		000
4034 880		00	4042 297		000
4035 018		00 Nd?	4042 397		00
4035 265		00 N	4042 511		000
4035 399		0	4042 591		000
4035 575		00	4042 743		0
4035 695		0	4042 909		00
4035 752		2	4043 054		0
4035 883 s		Co	4043 145		000
4035 976		Mn	4043 500		0 N
4036 131		Ti, Zr	0		4043 757
4036 251		000	4043 839	0	
4036 293		00	4043 956	Cr	
4036 522		0	4044 056	Fe	
4036 717		00	4044 141		
4036 813		000	4044 294 s	K	
4036 923		I	4044 423		
4037 076		00 Nd?	4044 531		
4037 268	Cr	2	4044 644		
4037 449		00	4044 766	Fe	
4037 585		000	4044 992		
4037 691		00	4045 108		
4037 837		I	4045 266	Mn	
4038 094		00 Nd?	4045 371	Mn	
4038 272		0	4045 538	Co	
4038 425		0	4045 662		
4038 627		00 Nd?	4045 748		
4038 771		I	4045 864		
4038 944		2	4045 975 s	Fe	
4039 094		00	4046 117		
4039 244	Cr	4046 230			
4039 444		4046 490			
4039 580		4046 612	Cr		
4039 727		4046 764			
4039 891		4046 917			
4040 013	Y	4047 171			
4040 093	Fe	4047 338	K?		
4040 243	Fe?	4047 461	Fe		
4040 411		4047 556			
4040 464		4047 823	Y		
4040 657		4047 958			
4040 792	Fe	4048 224			
4040 937	Ce, Nd, Co	4048 384			
4041 099		4048 549			
4041 221		4048 704			
4041 431	Fe	4048 818	Zn		
4041 525	Mn	(4048 883) s		Mn Cr Mn	
4041 803	Zr-	4048 910			
4041 957		4049 148			

\*Probably compound lines, of which there are many in the spectrum of Manganese

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4049 303		0	4056 007		000
4049 363		000	4056 135	Fe	0
4049 482	Fe	2	4056 221	Cr	0
4049 590		00	4056 345		0
4049 716		1 N d?	4056 495	Fe	1
4049 882		1 N d?	4056 601		0
4050 019		00	4056 708		00
4050 176		00	4056 955		000 N
4050 254	La	000	4057 055		00 N
4050 482	Zr	0	4057 225		00
4050 643		00	4057 368	Co	1 N
4050 716	Zr	00	4057 499	Fe	3
4050 830	Fe	2	4057 668		7
4050 963		000	4057 817		0
4051 095		00	4057 881		000
4051 204	V	00 N	4057 961		000
4051 336		00 N d?	4058 041	Pb	0
4051 491	Cr-V	0 N d?	4058 115	Mn	0
4051 742		000	4058 372	Co-Fe	4
4051 888	Mn	00 N d?	4058 539	•	000
4052 070	Fe	3	4058 615		00
4052 176		0	4058 748	Ce	0
4052 316		00	4058 915	Fe, Cr	3
4052 454	Fe	2	4059 081	Mn	3
4052 603	Mn	2	4059 239		00
4052 650	Fe	3	4059 373		0
4052 812	Fe	1	4059 535	Mn	*1 N d?
4052 871		1	4059 653		0
4052 992		000	4059 768		000
4053 091	Co	0	4059 872	Fe	2
4053 263		00	4060 117		00
4053 424	Fe	2	4060 248		00
4053 582		0	4060 415	Ti	1
4053 639		00	4060 643		0
4053 839		00	4060 777		00
4053 981	Fe Ti	3	4060 919		0
4054 085		000	4061 081		00
4054 225		0	4061 244	Nd-	3
4054 335	Fe	1	4061 450		000 N
4054 457		000	4061 595		0 N
4054 591	Zr	0	4061 881	Mn	*2 N d
4054 714	Sc	00 N	4062 105		2
4054 863		0	4062 197		00
4054 962		2	4062 385		00
4055 023	Fe	3	4062 469		000
4055 189	Ti-Fe	3	4062 599 s	Fe	5
4055 365	Mn	00 N d?	4062 789	Cu?	0
4055 533		00 N d?	4062 895		00
4055 701 s	Mn ? Fe	6	4063 105		00
4055 855		00	4063 260		00

\*Probably compound lines, of which there are many in the spectrum of Manganese

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4063 436	Fe	4	4071 137		00
4063 573	Mn	0	4071 252	Zr	0
4063 759 s	Fe	20	4071 501		000
4063 938		1 N d?	4071 680	Fe	1
4064 075		0 N	4071 780		0
4064 201		1	4071 908 s	Fe	15
4064 362	Ti	1	4072 059		0 N
4064 515	Ni	1	4072 121		000
4064 607	Fe	2	4072 295		00 N
4064 728		00	4072 508		0 N
4064 913	La	000	4072 655	Fe	2
4065 239	Mn-Ti	2 d?	4072 853	Zr	00
4065 388		0	4073 052	Ce	00 Nd?
4065 537	Fe	3	4073 287		0
4065 737		0 N	4073 493		000
4065 861	Cr	0	4073 637	Ce	0
4065 960		000	4073 780		000
4066 155		00	4073 921 s	Fe	4
4066 270		1	4074 203		00
4066 375		1	4074 488		0 N
4066 524	Co	2	4074 681		00
4066 742	Fe	2	4074 835		2
4066 870		0	4074 947	Fe	3
4066 975		0	4075 055	Ni, Zr, Cr	0
4067 139	Fe	5	4075 257	-Nd	2 N
4067 429	Fe	3	4075 468	Nd	0 N d?
4067 558	La	000	4075 661		000
4067 642		0	4075 857	Ce	0
4067 753		0	4075 995	Ce	00
4067 915		0	4076 101	Fe	3
4068 005		00	4076 201	Cr	00
4068 137	Fe-Mn	6	4076 283		00
4068 268		000	4076 375	Fe-Ce	1
4068 488		000	4076 516		00
4068 694	Co	0	4076 644	Fe-Zr	2
4068 801		000	4076 792	Fe	4
4068 999		00	4076 959	Fe	2
4069 115		000	4077 033		1
4069 221		2	4077 221	Cr	0 N
4069 306		00	4077 348		00
4069 423	Nd	0	4077 498	La, Y	1 N d?
4069 588		00	4077 630		0
4069 761		1	4077 731		0 N
4069 890		000	4077 885 s	Sr	8
4070 055		000	4077 985		0 N
4070 195		0	4078 126		0
4070 431	Mn	3	4078 318		00 Nd?
4070 589		00 N	4078 515	Fe	4
4070 777		00 N	4078 631	Ti	3
4070 930	Fe	4	4078 801		000 Nd?

\* Probably compound lines

## TABLE OF SOLAR SPECTRUM WAVE LENGTHS

31

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4078 977	Fe	0	4086 861	Ia	I
4079 161		00 N d?	4086 988		000
4079 335	Fe	2	4087 115		000
4079 393	Mn	3	4087 252	Fe	3
4079 508		000	4087 425		00
4079 570	Mn	3	4087 482		000
4079 707		000	4087 641		000
4079 863		00	4087 755		00
4079 996	Fe	3	4087 855		000
4080 209		00	4087 949		00
4080 368	Fe, Nd	3	4088 200		00
4080 588		00	4088 333		00
4080 751		00	4088 448		00
4080 921		00	4088 596		000
4081 033	Fe	2	4088 713 s	Fe	3
4081 190		00	4088 877		00
4081 385	Zr, Ce	0	4089 000		00
4081 415	Fe	1	4089 199		00 N
4081 580		00 N	4089 374	Fe	3
4081 736		00 N	4089 568		000 N
4081 887		00 N	4089 748		000 N
4082 060		000 N d?	4089 935		00 N
4082 264	Fe	2	4090 113	Mn	0 N d?
4082 428		0 N d?	4090 228	Fe	2
4082 589	Sc-Fe-I1	3	4090 338		000
4082 749	Co	0	4090 474	Cr	0 N
4082 928		00 N d?	4090 671	Zr	0
4083 095	Mn	4	4090 728	V	1
4083 243		000	4090 921	Zr	00 N d?
4083 376	Mn, Cu	0	4091 109		3
4083 515		000	4091 235		000
4083 715 } s	Fe	{ 2	4091 588		000 N
4083 783 } s	Mn, V	{ 4	4091 711	Fe	3
4083 917 s	Fe	1	4091 828		000
4084 148		0 N d?	4092 149		00
4084 476		0 N	4092 248		00
4084 647	Fe	5	4092 431	Fe	2
4084 761		000	4092 547	Co, Mn	3
4084 944		000 N d?	4092 665	Fe	1
4085 161	Fe	4	4092 821	*V, Ca?	3 d?
4085 303		00	4092 975		000
4085 408		1	4093 041	Co	000
4085 467	Fe	4	4093 185	Co	00
4085 595		000	4093 435		00
4085 727		00	4093 801		00
4085 881		00	4094 141		00
4086 008		00 N	4094 220		000
4086 133		1	4094 455		00
4086 283		0	4094 573		2 N
4086 469	Co-	3 d?	4094 761		000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4094 849		0 N	4102 541	Y	0
4095 094	<sup>1</sup> Ca?	4	4102 774		00 Nd?
4095 251		000	4102 914		00 N
4095 423	Mn	0	4103 097 s	Si, Mn	5
4095 511		0	4103 470		0
4095 633	V	0	4103 621		00
4095 795		000	4103 774		0 N
4095 901		000	4103 967		00 N
4095 968		000	4104 141		000
4096 129	Fe	3	4104 288	Fe	5
4096 262	Fe	2	4104 459		00
4096 367		1	4104 623	Co, V	0
4096 481		000	4104 807		000
4096 675		000	4104 909	Co, V	00
4096 795		00	4105 099		00
4096 848	Zr?	0	4105 216		1
4096 976		000	4105 318	V	00
4097 101		00	4105 514	Mn	2
4097 168		00	4105 807		00 N
4097 241	Fe	3	4105 879		000
4097 389		00	4105 981		000
4097 612		000	4106 294		000
4097 733		000	4106 420	Fe	000
4097 808		0	4106 583	Fe	2
4097 948		00	4106 738		00
4098 115		0	4106 887		0 N
4098 335	Fe	5	4107 099		0
4098 587		000	4107 449		00
4098 689	<sup>1</sup> Ca?	4	4107 649 s	Ce Fe Zr	5
4098 746		2	4107 815		000
4098 947		000	4107 934		00
4099 054		000	4108 041		00
4099 207		0	4108 181		00
4099 327	Ti	00	4108 289		1
4099 554		000	4108 454		000
4099 727	La	000	4108 547	Zr	00
4099 941	V	2	4108 687		2
4100 147		0	4109 062		0
4100 315	Fe	2	4109 215	Fe	3
4100 501		0	4109 374		000
4100 661		000	4109 609	Nd?	1
4100 731		000	4109 734	Cr	0
4100 901	Fe	4	4109 905	<sup>1</sup> V	2
4101 067		0	4109 953	Fe	3
4101 244		0	4110 114		000
4101 421	Fe	2	4110 194		00
4101 637		0	4110 454		00
4101 840		3	4110 547		00
4102 000 Hδ	H, In	40 N	4110 691	Co	00
4102 321	V	0	4110 854		4
					000

\* These lines coincide with the heads of bands due to Calcium. The bands probably become lines owing to the weak dilution of Calcium vapor in the Sun.



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4111 021	Mn	I	4118 148		00
4111 154	Mn?	I	4118 307	V	0
4111 355		000	4118 347		000
4111 509	Ce?	I	4118 581		000
4111 742		000	4118 708	Fe	5
4111 827		00	4118 934	Co	4
4111 940	<sup>2</sup> V	4	4119 050	Fe	2
4112 139		000	4119 207		000 N
4112 234		00	4119 411		00 N
4112 327		000	4119 550	Fe	I
4112 478	Fe	2	4119 679		0
4112 603		000	4119 823		0
4112 721		00 N d?	4119 950		0
4112 869	Ti	I	4120 075		0
4112 959		000	4120 202		000
4113 067		I	4120 368	Fe	4
4113 117	Fe	3	4120 625		000
4113 247		00	4120 775		0
4113 381	Mn	I	4120 926		000
4113 679		000 N d?	4120 995		00
4113 839		00 N d	4121 308		00
4114 021	Mn	00 N d?	4121 477 s	Cr-Co	6 d?
4114 271		00 d	4121 648	Zi	00 N
4114 461	Mn	000	4121 805		00 N
4114 606 s	Fe	4	4121 963 s	Fe, Cr	3
4114 771		00 N	4122 142		00
4114 934		00 N	4122 306	Ti, Cr	I
4115 094		2	4122 396		000
4115 189		000	4122 511		00 N
4115 330	<sup>2</sup> V	3	4122 673	Fe	3
4115 533		00 N	4122 819		I
4115 715		000	4122 936		00q
4115 834		000	4123 027		000
4115 961		000	4123 184		00 N
4116 047		00	4123 384	<sup>2</sup> La	12
4116 138		0	4123 430		00
4116 276		000	4123 539	V	0
4116 361		000	4123 664	Mn	I
4116 474		00	4123 713	Ti	000
4116 634	<sup>2</sup> V	I	4123 907	Fe	5
4116 707	<sup>2</sup> V	0	4124 030	Ce?	00
4116 859	Nd?	I	4124 097		00
4116 974		00	4124 260		000
4117 113		0	4124 359		000
4117 317		000	4124 510		000
4117 414		00	4124 645		0
4117 587		000	4124 782		000
4117 741		00	4124 938		0
4117 894		000	4125 067		0
4118 008		2	4125 285		000

<sup>2</sup>These are some of the stronger Vanadium lines, and they are probably capable of producing the solar lines given in the table, especially 4111 940

<sup>2</sup>One of the strongest Lanthanum lines

# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS III

By HENRY A ROWLAND

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4125 384		000	4130 804	Ba	2
4125 529		000	4130 847		000
4125 615		00	4131 013		0 N d?
4125 776	Fe	3	4131 151		000
4125 850		1	4131 271	Mn	1
4126 040	Fe	3	4131 419		000
4126 200	V	000	4131 507	Cr	0
4126 344	Fe	4	4131 606		000
4126 532		00	4131 748		0000
4126 673	Cr	2	4131 908		0
4126 798		00	4131 950		000
4127 007		1	4132 100	V	2
4127 070	Cr	00	4132 235	Fe	10
4127 225		00 N	4132 435		0 N
4127 426	Cr	0	4132 560	Ba?	0
4127 529	Ce	00	4132 690		3
4127 689	Tl	000	4132 863		1
4127 767	Fe	4	4133 062	Fe	4
4127 957	Fe	4	4133 284		000 N
4128 093		00	4133 441		000
4128 251	V-	6 d	4133 510		00
4128 461		00	4133 625		00
4128 543		00	4133 755	Fe	2
4128 658	Cr	000	4133 873		0000
4128 747		00	4133 965	Ce	0
4128 894		2	4134 010	Fe	3
4129 054		00 N	4134 159		0 N
4129 127		000 N	4134 345		0
4129 337	Ce-	3	4134 492	Fe?	3
4129 476	Cr	00	4134 589	V-Fe?	3
4129 616		2	4134 675		1
4129 657		000	4134 840	Fe	5
4129 760		00	4135 050		00 N
4129 882		1	4135 191	Mn	0
4130 112		0	4135 325		0000
4130 196	Fe	2	4135 447		0 d?
4130 291		000	4135 610		0 N d?
4130 401		00	4135 838		00
4130 520		00	4135 915	Zr .	0
4130 604		0	4136 090		00 N

Wave length	Substance	Intensity and Character	Wave-length	Substance	Intensity and Character
4136 245		0000	4143 200		00
4136 445		00	4143 316		000
4136 527		000	4143 430	Ti	000
4136 678	Fe	4	4143 572	Fe	4
4136 890		00 N d?	4143 664		2
4137 033		000	4143 782		0000
4137 156	Fe	6	4143 903		00 N
4137 272		0000	4144 038	Fe	15
4137 428	Ti, Mn	0 N d?	4144 130		00 N
4137 567		2	4144 238		1
4137 809	Fe, Ce	1	4144 353		00
4137 925		00	4144 402		00
4138 038		00	4144 538		00 N
4138 134		0	4144 674	Ce?	0 N d?
4138 288		00 N	4144 824		0000
4138 515		0 N	4144 923		00
4138 648		00	4145 018		00
4138 771		000	4145 152	Ce	0
4138 909		000	4145 242		0000
4139 008		0	4145 357		1
4139 140		00	4145 465		000
4139 244		0	4145 600		00
4139 378		00	4145 720		0 N
4139 524		00	4145 914		1 N
4139 611		000	4146 020		00
4139 764		00	4146 133		0
4139 885		00	4146 225	Fe	3
4140 089	Fe	6	4146 299		0
4140 216		0000	4146 544		00
4140 316		000	4146 655		00
4140 400	Fe?	0	4146 845		0 N
4140 558		3	4146 997		00
4140 611		00	4147 145		2
4140 910		0	4147 369		00
4140 985		00	4147 502		2
4141 096		000	4147 645	Mn	1
4141 208	Mn	0	4147 677		000
4141 405	Fe	000 N	4147 836	Fe	4
4141 690		0 N	4148 021		000
4141 809	La	0	4148 133		00 N
4142 025	Fe	4	4148 330		00
4142 180		00 N	4148 416		00
4142 330	Cr, h <sup>1</sup>	2	4148 552		00
4142 405	Si	2	4148 660		0
4142 562	Ce	00	4148 776		00
4142 629	Cr, h <sup>2</sup>	2	4148 878		00
4142 744	h <sub>2</sub>	2	4148 948	Mn	0
4142 923		0000	4149 077		00
4143 000		00	4149 285	C	0
4143 103		0	4149 360	Zr	2

Wave-length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4149 533	Fe	4	4155 476		00
4149 657		0	4155 588		00
4149 700		00	4155 683		00
4149 857		000	4155 802		00
4149 923		2	4155 875		000
4150 056	Ce	00	4156 072		1
4150 139		00	4156 238	Nd	0
4150 258		00 N	4156 391	Zr	1
4150 411		4	4156 471		3
4150 535		00	4156 612		1
4150 608	Co	1	4156 764		00
4150 706		00	4156 831		1
4150 865		00 N	4156 970	Fe	3 d?
4150 964	Ce	00 N	4157 167	Mn	00 N
4151 129	Zr, Ti	1	4157 356	C?	0
4151 225		00	4157 398	C?	000
4151 360	C?	0000	4157 586		00 Nd?
4151 429	C?	000	4157 738		00
4151 569	C?	0000	4157 948 s	Fe	5
4151 638	C?	0000	4158 171	C	00
4151 726		00	4158 242	C	00
4151 826		00	4158 428	C	00
4151 925		0	4158 538	C?	0
4152 108	Fe, La	2	4158 586	C?	00
4152 242	Ce?	1	4158 700	Co	00
4152 343	Fe	3	4158 959	Fe	5
4152 474	C	00	4159 207		00
4152 547	C?	00	4159 353		5
4152 687	C?	00	4159 401		000
4152 759	Zr	00	4159 562		00
4152 927	Cr, La	0	4159 640		00
4153 071		00 N	4159 805	Ti	0
4153 222	Cr	00	4160 025		0 Nd?
4153 283		000	4160 256		0
4153 404	C?	0000	4160 408		00
4153 542	Fe	1	4160 530		2
4153 652	C?	00	4160 722		0
4153 776	Co	0	4160 942		0
4153 971	Cr	1	4161 089		00 N
4154 071	Fe	4	4161 239		2
4154 265		2	4161 369	Zi-	2
4154 364		000	4161 471		000
4154 448		0	4161 571	Cr	00
4154 539		00	4161 682		4
4154 667	Fe	4	4161 834		0000
4154 824	C?	00	4161 961	Sr	1
4154 976	Fe	4	4162 110		000 N
4155 126		000	4162 281		00 N
4155 213		00	4162 454		00 N
4155 359		00	4162 623		1 N

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4162 825		1 N	4169 499		00
4163 068		00	4169 628		00
4163 144		000	4169 775		1 N d?
4163 281		000 N d?	4169 926		2
4163 449		00	4170 009	Cr	00
4163 516		000	4170 149		00
4163 642		0 d	4170 304		00
4163 818	11, Cr	4	4170 372	Cr	00
4163 959		000	4170 506		00
4164 069		00	4170 646		00
4164 180		00	4170 797		00
4164 313		000	4170 900		000
4164 423		0	4171 068	Fe	4
4164 493		0	4171 213	11,	4
4164 673		00	4171 433		000 N
4164 804		0	4171 597		00
4164 945		0	4171 720		00
4165 121		000	4171 854 *	Cr, La, Mn, Ni, Fe	2
4165 277		0	4172 066	11, Fe	2
4165 328		00	4172 211	Al?	1
4165 550	Fe	3 d?	4172 296	Fe	2
4165 676	Cl	00	4172 447		000
4165 759	Ce,-	2	4172 509		00
4165 951		00	4172 641		0
4166 161	Ba	0	4172 748		00
4166 262		00	4172 803		2
4166 356		00	4172 923	Fe	4
4166 458		0	4173 045		000
4166 511		000	4173 136		1
4166 691		000	4173 309		00 Nd?
4166 823		00 N d?	4173 480	Fe	2
4167 013		00 N d?	4173 624		3
4167 126	Ce	0	4173 710		3
4167 197		000	4173 841		00
4167 332		000	4173 950		00
4167 438		8	4174 095	Fe	3
4167 560		00	4174 240		0
4167 737		1 N d?	4174 343		000
4167 884	C	1 N	4174 479		00
4168 025		2	4174 568		0
4168 133	11, Ni	2	4174 647		000
4168 279		0000	4174 807		00 N
4168 336		000	4174 973	Cr	0
4168 446		0000	4175 082	Fe	4
4168 634		00 N	4175 292		1 N
4168 784		2	4175 383		000
4168 957		00	4175 496	Cr	00
4169 110		2	4175 625		00
4169 253		00	4175 806	Fe	5
4169 411		00	4175 941		000

\* Probably due to some common impurity of unknown origin. Is it Al? or Si? The Gallium line is also in this region, but I have no specimen of Gallium with which to determine its exact position. The Fe line is strong enough alone to account for it

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4176 074		1	4183 011		00
4176 222		000	4183 169		1
4176 427		00 N	4183 348		00
4176 569		00 N	4183 480	Zr	1 N
4176 739	Fe-Mn	5	4183 619		2 N
4177 034		0	4183 787		00 N
4177 153		00	4183 964		00 d?
4177 243		0	4184 158		4
4177 356		000	4184 472		2
4177 495	Nd	0	4184 641		0
4177 582		000	4184 794		000 N
4177 698	Fe	3	4185 058 s	Fe, Cr	4
4177 772		3	4185 155		000
4177 864		1	4185 310		00 N
4178 012		1 N	4185 523		00 N
4178 160		00	4185 705		00 N
4178 223		2	4185 807		00
4178 402		00 N	4185 939		0 Nd?
4178 547		0	4186 130		00 N
4178 644		00	4186 280	Ti	1
4178 790		00	4186 496	Cr	0 N
4178 884		000	4186 622	C?	000
4179 025		3	4186 778	Ce Zr	2 N
4179 106		0000	4186 955	C?	0000
4179 218		00	4187 204	Fe	6
4179 359		00	4187 409	La, C	00
4179 408	Cr, Co	0	4187 496	C	00
4179 542	V,-	3 d?	4187 615		000
4179 743		00	4187 747	Fe	2
4179 837		00	4187 878	Zr	0
4179 978	Zr	0	4187 943	Fe	5
4180 159		000	4188 019		3
4180 206	C?	00	4188 255	C	00 N
4180 314	C?	000	4188 479		00 Nd?
4180 405	C?	00	4188 608		000
4180 563		1	4188 741	C	0000
4180 732		00	4188 894		4
4180 839		000	4189 138	C,-	1
4180 970	C	2 N	4189 264		1
4181 065	Ti	000 N	4189 490		000 N
4181 243		00	4189 723	C,-	2
4181 353		0	4189 983	V	0 Nd?
4181 515		00 N	4190 147	Mn	0 N
4181 708		1	4190 287	Cr	0 N
4181 919	Fe	5	4190 397	C	0
4182 136		2	4190 552		00
4182 376		00 d?	4190 687		00
4182 548	Fe	3	4190 874	C, Co	1 Nd?
4182 755		00	4191 055		00 Nd?
4182 922		2	4191 240		00 N

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4191 321		000	4198 221	Fe	2
4191 433	C, Cr	0	4198 295		0
4191 595	Fe	6	4198 402		4
4191 843	Fe	3	4198 494	Fe	4
4192 017	C	00	4198 584		00
4192 171	Cr	0	4198 680		00
4192 258	La?	00	4198 800	Fe	3
4192 356	La?	00	4198 890		000
4192 557	C	00 N	4199 019	Cr	000 N
4192 728		2 N	4199 267 s	Zr-Fe	5
4192 910		00 N	4199 434		00
4193 072	C	00 N d?	4199 535		00
4193 274		00 N d?	4199 682		0000 N
4193 433		00	4199 831		00
4193 545	C	00	4199 901		000
4193 611	C	00	4200 045		1 N
4193 778		00	4200 148	Fe	2
4193 836	Cr	0	4200 261	Cr	00
4193 964	C	0	4200 451		000
4194 035	C	00	4200 611	Ni	1
4194 246		000 N d?	4200 761		1
4194 398	C	00	4200 858		0
4194 471	C	00	4200 946	Γ <sub>1</sub>	1
4194 646		0	4201 089	Fe	3
4194 784	C	00	4201 227		00
4194 886	C, -	1	4201 402		00
4195 006	Cr	1	4201 486		00
4195 155	C	0 d?	4201 585	Zr	0000
4195 318		000	4201 733		00
4195 492	Fe	5	4201 869	Fe, Ni-Mn	1
4195 572	C	00	4202 198 s	Fe	8
4195 684		1	4202 514		0 N d?
4195 785	Fe C	2	4202 668		00
4195 987		00 N	4202 750		00
4196 108	C	0 N	4202 919		2
4196 372	Fe	4	4203 100		0 N
4196 516	C	00	4203 287		1 N
4196 576	C	00	4203 464		00 N
4196 699	La	2	4203 620	Ti	00 N
4196 837	Fe	1	4203 730	Cr	2
4196 929	C	00	4203 851		0000
4197 041	C	00	4203 935	Ti	00
4197 153	C	000	4204 101	Fe	3
4197 257 s	C	2	4204 163	La	4
4197 390	Cr	0	4204 359	Cr	0
4197 518		00	4204 499		00
4197 666		000	4204 622	Cr	0
4197 806		00	4204 761		00
4197 901		00	4204 884		1
4198 053		0000	4204 916		2

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4205 054		000	4212 200		00 N
4205 186		1	4212 393	C	00 Nd?
4205 239		1	4212 564		00
4205 421		000	4212 801	Cr?	3 N
4205 545	Fe	1 N	4213 010	C	00
4205 702		2	4213 135		00 N
4205 894		000 N	4213 323	C, Cr	0 N
4206 059		00	4213 434	C?	000
4206 127		000	4213 579		00
4206 289		000 N	4213 679	C	000
4206 461		0	4213 812	Fe	3
4206 583		00	4213 991		0
4206 735		1	4214 070	Zr-C	0
4206 862	Fe	3	4214 198		00
4207 059	Cr	00	4214 295		000
4207 109		0000	4214 406	C	00
4207 291	Fe	3	4214 527		00
4207 410		000	4214 634		00
4207 566	Fe	1 N	4214 787	C	00
4207 788		00 N d?	4214 994		00
4207 982		0	4215 075	C	00
4208 110		0000	4215 221		0
4208 266		00	4215 337	C	00
4208 333		000	4215 459	C	00
4208 415		00	4215 581 s	Fe	2
4208 514	Cr	0	4215 703 s	Sr	5 d?
4208 609		00	4215 924		00
4208 766	Fe	3	4215 971		000
4208 941		00	4216 136 s	C	1
4209 015	C	00	4216 351	Fe	3 d?
4209 144	Zr	1	4216 516	Cr	0
4209 347		00 N d?	4216 760		1 N
4209 521	Cr	0	4216 966		000
4209 660	C	0	4217 061		000
4209 762		0	4217 220		00
4209 914	Cr	0	4217 365		1
4209 985	V	1	4217 420		1
4210 224	C	00 N d?	4217 720	La, Fe-C1	5 d?
4210 494	Fe	4	4217 917		000
4210 561		3	4218 038		000
4210 662		0000	4218 214		00
4210 783	-C	00	4218 384		1
4210 860	C	000	4218 558	-Zr	1 N d
4211 127		3 N	4218 726		000
4211 350		00 N	4218 885		3 N
4211 512	C-Cr	0 N	4219 081		000 N
4211 675		00	4219 177		000 N
4211 795		000	4219 358		1
4211 899	Mn, C	0	4219 516	Fe	4
4212 048	Zr	2	4219 580		3



TABLE OF SOLAR SPECTRUM WAVE-LENGTHS 41

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4219 756		000	4227 129		1 N d?
4219 895		00	4227 316		00 N
4220 064		00	4227 474		1 N
4220 212		1	4227 606	Fe	4
4220 330		00	4227 822	Li	00
4220 509	Fe	3	4227 918	Zr	0
4220 643		0000	4228 103		1 N
4220 738	Mn	000	4228 265		000
4220 813		00	4228 475		00 N
4220 967		00	4228 716		000
4221 179		000	4228 879		1
4221 332		00	4229 032		000
4221 468		00	4229 206		00 N
4221 633		1 N	4229 419		000
4221 737	Cl	0	4229 566		0
4221 853		00	4229 677	Fe	2
4221 975		000	4229 926	Fe	3
4222 183		000	4230 075		1 N
4222 382 s	Fe	5	4230 267		00 N
4222 611		00 N d?	4230 413		00 Nd?
4222 768		0	4230 560	Cr	000
4222 890	Cl	0	4230 638		0
4223 061		00 N	4230 734		0
4223 256		1 N	4230 861		000
4223 396		0	4230 985		00
4223 509		00	4231 183	Ni	4 N
4223 643		1	4231 360		000 N
4223 738		1	4231 573		000 Nd?
4223 891		0	4231 767	Al	1
4224 060		00	4231 846		1
4224 138		000	4231 997		0000
4224 337	Fe	4	4232 111	Nb?	1
4224 463		0	4232 201		000 N
4224 619		0	4232 353		00 N
4224 673	Cr Fe	3	4232 544		00
4224 792	Li	00	4232 618		00
4225 020		2 N	4232 765	V	00
4225 206		000	4232 887	Fe	2
4225 378		0	4233 013		000
4225 490		000	4233 086	-V	1 N
4225 619	Fe	3	4233 328	Mn Fe	4
4225 874		1	4233 404		00
4225 970		000	4233 564		000 N
4226 116	Fe	2	4233 772	Fe	6
4226 239		000	4234 171	Co, V	0 N
4226 381		000	4234 385		0 N
4226 510		0	4234 565		00
4226 584	Fe	2	4234 707	Zi	0 N
4226 724	Si?	0	4234 895		000 N
4226 904 s g	Ca	20 d?	4235 054		000 N

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4235 155	Mn	0000	4242 167	Fe	000
4235 298		2	4242 322		0
4235 450	Mn	3	4242 443		0
4235 679	Fe	000	4242 535		2
4235 796		00	4242 615		2
4235 894		0	4242 766		2
4235 994		0	4242 897		2
4236 112		8	4243 060		0000 N
4236 279		1	4243 181		0000 N
4236 429		1	4243 364		1 d?
4236 540		00	4243 518		1
4236 714		00 N	4243 608	Fe	3
4236 801	Ni	00	4243 714		1
4236 966		1 d	4243 981		2
4237 119		0	4244 153		00
4237 240		1	4244 245		00
4237 339		3	4244 406		0
4237 412		1	4244 500		00
4237 655		000 N	4244 568		00
4237 836		0	4244 717		0000
4237 946		000	4244 888		00
4238 050	Fe	00	4244 971		00
4238 188		3	4245 104	Fe	0000
4238 398		00	4245 243		0 N
4238 555		1 N t?	4245 422		4
4238 778		00 N	4245 520		2
4238 918		0	4245 671		0000
4238 970		5	4245 772		0000 N
4239 107		00	4245 969		0000 N
4239 203		0000	4246 071		00
4239 304		000	4246 180	Fe	0
4239 525		2	4246 251		2
4239 642	Zr	00	4246 415		00 N
4239 759		00	4246 577		0 N
4239 890		3	4246 729		000
4240 014		3	4246 996	Y?	5
4240 115		1	4247 279		00 N
4240 246		000	4247 464		1
4240 359		0 N	4247 591		4
4240 540		2	4247 726		0
4240 622		1	4247 886		0
4240 763		000	4248 057		000
4240 872		1	4248 215		0 N d?
4240 959		000	4248 384	Fe	2
4241 127	Fe-Zr	00 N d?	4248 485		00
4241 285		2	4248 575		1
4241 485		00 N	4248 696		0
4241 682		00 N	4248 882		2 N
4241 866		00 N	4249 102		2 N
4242 002		000	4249 272		00
				Ti	

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4249 416		000	4258 201	Zr	0
4249 507		00	4258 219		1 N
4249 648		1 N	4258 477	Fe	2
4249 797		2 N	4258 639		0 N
4249 959		000 N	4258 774	Fe	2
4250 205		000	4258 885		1 N
4250 287 s	Fe	8	4259 113	Fe	2
4250 629		00	4259 249		0
4250 863		0	4259 305		0
4250 945 } s	Fe	8	4259 460		1 N d?
4251 071 } s		1	4259 664		000 N
4251 491		0 d?	4259 917		0 N
4251 662		000	4260 151	Fe	2
4251 783	Ti	00	4260 282	Fe	3 d?
4251 905	Li	00	4260 494		0 N
4252 043		000	4260 640	Fe	10
4252 218		00 N d?	4260 768		0 N
4252 388		00	4260 888		1
4252 468	Co	0	4260 991	Ti	0
4252 618		00 N	4261 162		000 N
4252 785		0 N	4261 376		2
4252 917		1 N	4261 496	Cl, Mn	0
4253 157		1	4261 679	Cl	2
4253 363		1	4261 748	Li	00
4253 522		00	4261 891		2
4253 696		00	4262 086		1
4253 888		0	4262 142		1
4254 063		1	4262 287	Cr	00
4254 236		000	4262 498	Cl	0
4254 505 s	Cr	8	4262 733		00
4254 821		000 N	4262 864		0
4255 002		00	4263 126		000
4255 134	Fe	2 d?	4263 290	Li, Cl	2
4255 406		1	4263 419		0
4255 659	Fe, Cr	1	4263 581		00 N
4255 791		1 N	4263 760	La	0 d?
4255 993	Fe	2 N	4263 996		000 N
4256 177		00	4264 128		1
4256 287	Ti	0	4264 370	Fe	3
4256 366		1	4264 431		00
4256 469		00	4264 615		1
4256 575	Zr	00	4264 738		00
4256 760		0	4264 895	Fe	2
4256 966		0	4265 083		00
4257 294		00 N	4265 238		000
4257 517		00	4265 418	Fe	2
4257 661		000	4265 584		00
4257 815	Mn	2	4265 696		0
4257 977		000	4265 832	Ti	0
4258 079		0000	4266 081	Mn	2

# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS IV

By HENRY A ROWLAND

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4266 233	Ti	ooo	4272 114	Ti-	1 N
4266 374		oo	4272 299		ooo N
4266 586		oo N	4272 458		o N
4266 778	Cl	o	4272 590	Ti-	oo
4266 894		o	4272 701		1
4267 122		3	4272 869		ooo
4267 291	Fe	ooo N	4273 049	Fe	1 d?
4267 439		ooo	4273 274		oo N
4267 543		2 N	4273 482	Zr	3 N
4267 741	Zr	oo	4273 643		2 N
4267 900		1	4273 835		oo
(4267 950) } s	Fe		4273 946	Fe?	o
4267 985		3	4274 045		1
4268 138		o	4274 096		1
4268 266	Zr	1 N	4274 348	Ti	2 N
4268 449		ooo N	4274 542		oo N
4268 606		ooo N	4274 746	Cr	2
4268 783	Fe	o	4274 958 s		7 d?
4268 915		2	4275 115		o
4269 088	La	oo N	4275 262	Ti	oo
4269 202		oo N	4275 413		o N
4269 339		ooo	4275 541	Zr	o N
4269 446	Ti-	o	4275 667		oooo
4269 625		o	4275 713		o
4269 746		oo	4275 814	Ti	o
4269 898	Ti-	2	4275 866		o
4270 016		2 N	4276 050		ooo N
4270 120	Ti-	oo	4276 150	Zr	oo N
4270 329		1 N	4276 259		o
4270 485		oo	4276 428	Ti	o
4270 649	Fe	oo N	4276 587		o
4270 880		oo N	4276 685		ooo
4271 112	Fe	oooo N	4276 836	V-	2
4271 212		o N	4276 979		ooo
4271 325		6	4277 147	Zr	1 N
4271 538	Fe	o	4277 384		1 N
4271 618		oo	4277 544		o
4271 715	Fe	oo	4277 692	Zr	2 d?
4271 790		o N d?	4277 835		oo
4271 934 s		15	4277 968		oooo



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4292 450		2	4299 846		00
4292 616		0000	4299 989		1 N
4292 739		000	4300 135		0
4292 827		0000	4300 211	Ti	3
4292 940		0000	4300 376	Mn	0
4293 035		0000	4300 478		1 N
4293 192	s	2	4300 732	Ti	2
4293 273		3	4300 895		0
4293 486		000 N	4300 987		1
4293 714		00	4301 158	Ti	2
4293 817	Cr	000	4301 262		4
4293 957		0	4301 332		1
4294 077		000	4301 442		0
4294 204	Ti	2	4301 658		0 N
4294 301	Fe	5	4301 902		0 N d?
4294 531		00	4302 085	Ti	2
4294 781	W	00 N d?	4302 238		00
4294 936	Zr	2	4302 353	Fe	2
4295 015		0000	4302 460		2
4295 194		3 d?	4302 692 s	Ca	4
4295 383		3 N d?	4302 913		2 N
4295 578		000	4303 072		1 N
4295 747		000	4303 247		0
4295 914	Cr, Ti	2	4303 337		2
4296 044	Ni	1	4303 584		1 N
4296 235	La	0 N	4303 754		1
4296 375		0 N	4303 880		0
4296 548		000 N	4303 992		2
4296 735		3	4304 098		4
4296 840	Zr?	1	4304 300		00
4296 933		0 N	4304 415		1
4297 110		2	4304 552		1
4297 202	Cr	1	4304 729		2
4297 369		2	4304 882	Zr	0
4297 448		2	4305 013		0 N
4297 684		1 N	4305 266		1
4297 908	Cr, V	0	4305 377		0
4298 136	Ti	1	4305 479		1
4298 195	Fe	2	4305 614	Fe, Sr, Ti, Cr	3
4298 355		1	4305 772		000
4298 531		000	4305 871		2
4298 675	Ni	00	4306 006		1
4298 828	Ti	2	4306 078 s	Ti	4
4298 967		2	4306 305		2 N
4299 149 s	Ca	3	4306 521		00 N
4299 296		1	4306 758		0
4299 410	Ti, Fe	4	4306 858		2
4299 524		0	4307 017		2
4299 641		0	4307 215		000 Nd?
4299 803	Ti	2	4307 342		000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4307 465	Ca Fe	2 N	4314 673	Li Fe	o N
4307 720		2 N d?	4314 894		oo
4307 907 } <sub>3</sub> G		3	4314 964		i
4308 c81 }		6	4315 138		3
4308 206		o	4315 262		4
4308 334		i	4315 446		ooo N
4308 449		oo	4315 626		oo N
4308 541		oo	4315 769		oo N
4308 601		oo	4315 901		oooo
4308 759		2 Nd?	4316 032		ooo
4308 937	Fe	ooo	4316 115	Ti?	oo
4309 063		i	4316 246		oo N
4309 198		2	4316 720		ooo N
4309 290		o	4316 832		ooo
4309 365		o	4316 962		i
4309 541	Fe	3	4317 125		o
4309 621		i	4317 226		o
4309 792		i	4317 484	Zr	o N
4309 876		i	4317 618		ooo
4309 993		o	4317 883		o N
4310 066		o	4318 064		oo N
4310 266		2	4318 232		o N
4310 388		i	4318 369		oo
4310 540		2	4318 522		o N d?
4310 631		i	4318 631		ooo
4310 722		o	4318 817 s	Ca, Mn?	4
4310 862		2 N	4318 960		oo
4311 058	Mn	i	4319 099		oo
4311 146		i	4319 252		ooo N
4311 328		2	4319 455		ooo N
4311 486		oo	4319 615	Cr	o
4311 608		2	4319 799		o
4311 674		2	4319 969		ooo N
4311 880		2 N	4320 140		oo N
4312 050		oo	4320 318		oo
4312 247		2	4320 535		o
4312 311		i	4320 661		o
4312 462		2	4320 756		oo
4312 665		oo	4320 907	Sc	3
4312 723	Ti	i N	4321 119		2
4312 871		o	4321 294		oo
4313 034		3	4321 395		oo
4313 193		i N	4321 583		o N
4313 399		oo N	4321 678		oooo
4313 577		oo N d?	4321 813	Ti Fe	o
4313 797		2 Nd?	4321 961		2
4314 052		oo N	4322 204		o N
4314 248	Sc	3	4322 373		oo N
4314 381		i	4322 521		oo N
4314 479	Ti	i	4322 670	Cr	o N

Wave-length	Substance	Intensity and Character	Wave-length	Substance	Intensity and Character
4322 862		00 N	4330 063		00
4322 992		00 N	4330 189	V	0 N
4323 167		I	4330 405		I
4323 222		0	4330 566		0
4323 386		2 N d?	4330 609		0
4323 531		0	4330 743		000
4323 670		I	4330 866 <sup>*</sup>	Ti, Ni	2
4323 772		0	4330 984		00
4323 872		0000	4331 119		I
4324 007		3	4331 229		00
4324 138		I	4331 402		000 Nd?
4324 246	Zi	0	4331 614		0 N
4324 340		0	4331 811	Ni	2
4324 572		2 N	4331 944		00 N
4324 775		00	4332 172		00 N
4324 886		00	4332 339		00 N
4324 977		0	4332 620		00
4325 152	Sc	4	4332 745		0 N
4325 306	Ti, Cr	I	4332 988	V	0
4325 516	Ni, Zr	I	4333 082		0
4325 648		000	4333 212		00
4325 777		I	4333 367		0 N
4325 939 <sup>s</sup>	Fe	8	4333 525		00
4326 119		I	4333 588		00
4326 213		0	4333 758		000
4326 383		0000	4333 925	La	I N
4326 520	Ti	0	4334 063		00
4326 641		000 N	4334 174		00
4326 779		000 N	4334 228		00
4326 923	Fe	2	4334 354		00
4327 082		0 N d?	4334 407		00
4327 274	Fe	3	4334 600		000 Nd?
4327 319		00	4334 833		0
4327 479		000 N	4334 965		0
4327 616		000 N d?	4335 102	La	0
4327 961		00	4335 248		00 N
4328 080	Fe	2	4335 434		I N d?
4328 202		00 N	4335 611		00 N
4328 365		000	4335 762		00 Nd?
4328 446		000	4335 944		00 N
4328 598		000	4336 076		00
4328 772		0 N	4336 147		000
4329 007		00	4336 295		0000
4329 089		000	4336 433		00
4329 213		00	4336 602		000 Nd?
4329 306		0000	4336 774		00 N
4329 448		0 N	4336 951		00
4329 559		0 N	4337 034		00
4329 712		00	4337 216	Fe	5
4329 853		00	4337 414	Cr	0

<sup>\*</sup> This is a weak, hazy Ni line. It is faintly present in a specimen of meteoric iron. The Ni line is on the red edge of the solar line and the Ti line is nearer the center.



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4337 569	Mn'	00	4345 506		0000
4337 725	Cr	3	4345 593		0000
4337 945	<del>Sr</del>	00	4345 767		00 N
4338 084	Ti <sup>+</sup>	4	4345 933		00
4338 245		000	4346 068		0 N
4338 292		00	4346 278		00
4338 430	Fe	1	4346 454		1
4338 616		0 d?	4346 580		00
4338 779		00	4346 725	Fe	2
4338 854		0	4346 835		00
4338 993		0 N	4346 987	Cr	1
4339 170		000	4347 066		0000
4339 294		0	4347 199		000
4339 416	Fe	0	4347 266		000
4339 617	Cr	4	4347 403	Fe	1
4339 882	Cr	3	4347 532		00 N
4340 070		000	4347 705		1 N
4340 192		000	4347 845		000
4340 297	Cr	0	4348 003	Fe	2
4340 634 <i>Hγ</i>	II	20 N	4348 130	CH	1 N
4341 007		00 Nd?	4348 266		000
4341 167	V	0	4348 349		00
4341 286	Zr	0000	4348 497	CH	1 N
4341 410		00	4348 651		00 N
4341 530	Ti? $T_6^+$	2	4348 800		00 N
4341 723		00	4348 933		00 N
4341 880		0	4349 107	Fe	2
4341 991		0	4349 330		000 N
4342 087		0	4349 538		000
4342 219		000	4349 967	Q <sup>+</sup>	00
4342 350		0	4350 119		00 Nd?
4342 482		00	4350 319		0
4342 750		000 N	4350 413		0
4343 004		000 N	4350 550	Ba?	00 N
4343 150		00 N	4350 747	Fe	0 N
4343 372 } s	Cr	2	4350 921		0000
4343 431 } s	Fe	2	4351 000	I <sup>+</sup>	1
4343 577		00 N	4351 216	Cr	3
4343 662		0 N	4351 338		00
4343 861	Fe	2	4351 464		00
4344 015		0000	4351 551		00
4344 130		1 N	4351 711	Fe	2
4344 306		00 N	4351 871		0000
4344 451	Ti <sup>+</sup>	2	4351 930	Cr Fe <sup>+</sup> CH	5
4344 670	Cr	4	4352 083	Mg	5 N d?
4344 830		000	4352 235		0 N
4344 906		00	4352 425		0 N
4345 052		0	4352 559		00 N
4345 246		00	4352 718		0 N
4345 399		0000	4352 908 s	Fe	4

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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4353 044	V	o	4360 451	Fe, Zr	I
4353 214		ooo N	4360 644		I
4353 337		oo N	4360 796		ooo
4353 596		oo N	4360 958		I
4353 678		oo N	4361 091		ooo
4353 813		oo N	4361 219		ooo Nd?
4353 985		oo	4361 405		oo
4354 110		o	4361 474		oo
4354 228		oo	4361 676		oooo
4354 426		o N d?	4361 828		ooo
4354 597		oo	4361 955		oo N
4354 674		oo	4362 021		oooo
4354 776		I	4362 198		ooo
4354 927		o N	4362 262		o
4355 112		oo N	4362 387		oo
4355 257	Ca?	2	4362 542	Si?	ooo
4355 509		o	4362 690		I
4355 578		oo	4362 909		o N
4355 746		oo	4363 113		oo N
4355 867		o	4363 267		I N
4356 058		o	4363 457		o N
4356 163		o	4363 629		o
4356 299		oo	4363 766		o
4356 414		ooo	4363 979		oo N
4356 528		o	4364 136		ooo
4356 766		o	4364 198		I
4356 901		oo	4364 349		I
4357 071		o	4364 490		oo
4357 223		ooo	4364 662		oo N
4357 312		oo N	4364 827	Ce	oo
4357 457	Ni	oo	4365 031		ooo
4357 677		o N d?	4365 168		ooo
4357 865		ooo	4365 451		oo N
4358 033		o	4365 694		o
4358 178		oo	4365 885		oo N d?
4358 328		o	4366 061		2
4358 521		oo	4366 246		oo N
4358 670		2	4366 362		oo N
4358 879		o	4366 572		oo
4358 985		oo	4366 660		I
4359 084		oo	4366 838		I
4359 236		ooo	4367 068		oo
4359 358		oo	4367 222		ooo
4359 500		oo	4367 354		oo
4359 654	Fe Y-Zr	o	4367 495		oo
4359 784 s		3	4367 637		oo
4359 907		o	4367 749		Fe
4360 067		oo	4367 839		Ti
4360 150		oo	4367 882		oo
4360 280		oooo	4368 071		2

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4368 224		00	4375 216		000
4368 291		0	4375 358		0 N d?
4368 462	Ni	0	4375 493	Cr	0
4368 629		000	4375 643		00
4368 801		0	4375 734		0
4369 052	Ti	00 N d?	4375 823		0
4369 254		00	4375 940		0000
4369 428		00	4376 107	Fe	6
4369 568	Fe <sup>+</sup>	I	4376 381		00 N
4369 708		00 N d?	4376 572		0 N
4369 873	Ti	0	4376 727		0 N
4369 941 s	Fe CH	4	4376 942	Fe, Cr	I
4370 025		00	4377 113		00 N
4370 189	Ni	00	4377 254		00 N
4370 318		0	4377 388		2 N
4370 453		0	4377 533		0 d?
4370 583		00	4377 706		0
4370 743		000	4377 948	Fe	I
4370 815		00	4378 149		00 N
4371 016		000	4378 419		2 N d?
4371 144	CH Zr <sup>+</sup>	I	4378 677		0 N d?
4371 221		I	4378 902		00 N
4371 320		00	4379 071		I N
4371 442	Cr	2	4379 232		00 N
4371 588		0 N d?	4379 396*	V	4
4371 748		000	4379 565		000
4371 957		0 N	4379 691		00
4372 115		00	4379 798		000
4372 184		00	4379 927	Zn + Cr	0
4372 360		000	4380 066		000
4372 498		0 d?	4380 325	Co	2 N d?
4372 656		00	4380 395		000
4372 747		0000	4380 521		00
4372 899		0	4380 655		0
4373 008		0	4380 883		2 N d?
4373 148	Fe <sup>+</sup>	0	4381 004		00 N d?
4373 278		000	4381 146		00
4373 415	Cr	I	4381.274	Cr	0
4373 554		00 N	4381 451		00 N
4373 727	Fe	2	4381 875		00
4373 813		0000	4382 045	Mn	00
4373 949	V	0	4382 159		00
4374 055		0	4382 325		00
4374 206		000	4382 475		00 N
4374 331	Cr	I	4382 676		0
4374 384		I	4382 847	Mn	0
4374 628	Sc, FeZi	3	4382 928	Fe	2
4374 775		00 N	4383 156		0 N
4374 981	Zr	0	4383 332		00 N
4375 103	V, Mn	2	4383 468		000 N

\* The strongest Vanadium lines in the whole solar spectrum or in this part, if not the whole, of the Vanadium spectrum

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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4383 535	Fe	000 N	4390 790	Fe Ti <sup>+</sup>	0
4383 720 s		15	4390 932		00 N
4383 879		000 N	4391 002		0000
4383 990		000 N	4391 123 } s		2
4384 122		000 N	4391 192 }		1
4384 284		0 N	4391 306		000
4384 477		1	4391 462		00
4384 698	Ni	0	4391 642		00
4384 873 <sup>+</sup>	V <sup>+</sup>	3	4391 824	CoCe <sup>+</sup>	0
4384 986	Cr	0	4391 924	Cr	1
4385 144	La <sup>+</sup> - Fe	2	4392 034	Co	0
4385 286		1	4392 235	V?	1 N
4385 406	Fe <sup>+</sup>	1	4392 470	Fe?	00 N
4385 548		2	4392 591		000 N
4385 767		00	4392 752		1
4385 833		00	4392 947		00 N
4386 016		00 N	4393 085		00
4386 221		0 N	4393 196	V?	0
4386 433		0000 N d?	4393 442		0
4386 616		0	4393 686		1 N d?
4386 750		00	4393 858		0
4386 855	Ti <sup>+</sup>	00 N	4393 974	V?	0
4387 007		1	4394 093	Ti	0
4387 220		1 N	4394 225	<del>Ti</del> Ti <sup>+</sup>	2
4387 420		000 N	4394 342		00
4387 559	Cr	0	4394 463		000
4387 658 }		0	4394 782		000
4387 762 }		0	4394 943		00
4387 906		000	4395 020	Zr	00
4388 057	Fe, Co	2	4395 201	Ti <sup>+</sup>	3
4388 260	Mn	00 N d?	4395 413 <sup>a</sup>	V, Zr	2
4388 411		00 N	4395 448		00
4388 571	Fe	3	4395 665	Fe	0
4388 746		00 N	4395 843	Ti <sup>+</sup>	000 N
4388 887		0	4396 008		1
4389 029		0 N	4396 224		00
4389 190		000	4396 312		00
4389 247		00	4396 471		0
4389 413	Fe <sup>+</sup>	2	4396 592		00
4389 555		000	4396 790		00 N
4389 667		0 N	4396 931		000
4389 801		0	4397 125		1 N
4389 930	Mn, Ni?	0	4397 306		00
4390 034		00	4397 428		00
4390 149 <sup>a</sup>	V	2	4397 550		00
4390 273		000	4397 742		000 N
4390 379	Ni	00	4397 952		00 N d?
4390 496		00	4398 178	3 Y <sup>+</sup>	1
4390 617	Fe?	1	4398 334		00
4390 699		0	4398 460	Ti <sup>+</sup>	0

<sup>+</sup>The strongest Vanadium lines in the whole solar spectrum or in this part, if not the whole, of the Vanadium spectrum

<sup>a</sup>Very strong Vanadium lines

<sup>3</sup>In Zircon but not in Zr

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4398 651		o N	4406 997		oo
4398 784		oo	4407 155		oo
4398 879		oo	4407 297		ooo
4399 010		oo	4407 432		o N
4399 230		oo N	4407 533		oo N
4399 379		oo	4407 680		ooo
4399 451	<del>Ni</del> Ni	o	4407 810 } s	V <sup>++</sup>	2
4399 640		oo	4407 871 }	Fe	4
4399 776	Ni	o	4408 022		ooo
4399 935	Ti <sup>+</sup> Cr	3	4408 096		oo
4400 149		oo N	4408 236		ooo
4400 343	Zr	o N d?	4408 364 <sup>*</sup>	V	2
4400 555	Sc <sup>+</sup>	3	4408 582	Fe	3
4400 738	V	1	4408 683 <sup>*</sup>	V	2
4400 844		ooo	4408 818		oo
4401 020	Ni	o N	4408 956		oo N
4401 183		1 N	4409 096		oo N
4401 241		ooo	4409 288	Fe?	1
4401 456	Fe	2	4409 408		o
4401 613	Fe	1	4409 525		oo N
4401 709	Ni	2	4409 683	Ti <sup>+</sup>	1
4401 828		ooo	4409 853		ooo N
4402 509		oo N	4410 015		ooo N
4402 640		oo N	4410 168		o N
4402 843		ooo N	4410 328		oo N
4403 111		oo N	4410 463	Cr	oo N
4403 241		oo	4410 683	Ni	2
4403 347		1	4410 817		ooo
4403 532	Cr, Zr	o	4410 923		oooo
4403 661	Cr	oo	4411 019		oo
4403 815		oo N	4411 111		ooo
4403 990		oo N	4411 240	Ti <sup>+</sup> -Mn <sup>+</sup> Cr	1
4404 131		o	4411 385		oo N
4404 261		oo	4411 748		oo N
4404 433	Ti	1 N	4411 882		oo N
4404 563		oo	4412 043	Mn	ooo
4404 706		oo N	4412 092	Ti <sup>+</sup>	1
4404 757		oo N	4412 297	V	oo
4404 927 s	Fe	10	4412 415	Cr	o
4405 082		oo	4412 581		oo N
4405 191		1	4412 861		oo N
4405 472		ooo	4413 042		oo N
4405 576		oo	4413 280	Zr	oo N
4405 728		oo N	4413 560		oo N
4405 896		o N d?	4413 756		1
4406 201		oo	4413 944		ooo
4406 319		o	4414.011	Cr	o
4406 456		ooo	4414 207		ooo
4406 662		oo	4414 278		oo
4406 810 <sup>*</sup>	V-	2	4414 391		oo

\* Very strong Vanadium lines

# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS V

By HENRY A ROWLAND

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4414 621		00	4420 832		00
4414 714	Zn	00	4421 090		000
4414 896		000	4421 290		00 N
4415 047	Mn	2	4421 495		00
4415 199		{ 000 N	4421 616		00
4415 293	Fe	8	4421 733	V	0
4415 414		{ 000 N	4421 928	Ti	00
4415 586		000	4422 104	Ti+	1
4415 722	Sn+	3	4422 226		0
4415 945		00 N	4422 461		00 N d
4416 074		000	4422 666		00
4416 224		00	4422 741	Fe, V+	3
4416 319		00	4422 872		000
4416 517		00 N	4422 985	Ti	0
4416 636	V	0	4423 134		0 d?
4416 811		00 N	4423 298	Fe	1
4416 985	A Fe Fe+	2	4423 430	Cr	0 N
4417 163		000	4423 630		000
4417 275		00 N	4423 747		000
4417 450	Ti	0	4423 843		000
4417 577	Co	00	4424 006	Fe?	2
4417 740		00	4424 133		0
4417 884	Zr-Ti+	3	4424 368		00
4418 044		000	4424 457	Cr	0
4418 199		00 N	4424 531	Sn+	00
4418 366		000	4424 748		0 N d?
4418 499	Ti+	1	4424 975		00 N d?
4418 590		00	4425 321		000 N
4418 734		00 d?	4425 608	Ca	4
4418 944		00 N	4425 827		00
4419 106		00 N	4425 931		00 N
4419 265		00 N	4426 121		000
4419 440		00 N	4426 201	Ti	0 N d?
4419 675		00	4426 536		000
4419 768		000	4426 617		000
4419 944	Mn	00 N	4426 839		000 Nd?
4420 100	V	00 N	4427 054		000 Nd?
4420 266		00 N	4427 266	Ti	2
4420 447		0	4427 482	Fe	5
4420 686	Zr	00	4427 623		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4427 760	La	000	4436 000		0000
4427 875	La	0000	4436 162		000 N
4428 083		00 N	4436 313	V	0
4428 256		00 N	4436 516	Mn	2
4428 438		00 N	4436 750		00
4428 711	V-Cr	1 d?	4436 852		00
4428 873		00	4436 949		00
4429 077		000	4437 112	Fe-Ni	2 d?
4429 366		00	4437 297		000 N
4429 456		00	4437 429		000 N
4429 664		000 N	4437 589		000 N
4429 804		000 N	4437 729		0
4429 958	V	00	4437 862		00
4430 070	La	00 N	4438 006	V	0
4430 221	La	00 N	4438 192		00
4430 356	Fe	1	4438 359	Sr, Zl, Ti	00 Nd?
4430 524		00	4438 510	Fe	1
4430 646		00	4438 687		00 N
4430 785	Fe	3	4438 790		00
4430 929		0	4438 953		0000
4431 302		0 N	4439 127		0000
4431 453		000	4439 332		0 N d?
4431 525	Sc <sup>+</sup>	0	4439 521		00
4431 660		000	4439 649		0000
4431 785		00	4439 806		0
4432 009		0	4439 911		000
4432 247		00	4440 054	Fe	1
4432 330	Cr	0	4440 231		000 N
4432 477		0000	4440 342	Fe	00 Nd?
4432 587		000	4440 515	Ti	00
4432 736	Fe	1	4440 635	Zr-	1
4432 904		00 N	4440 787		00 N
4433 089		000 N	4440 989		1
4433 208		00 N	4441 151	Fe	0
4433 390	Fe	3	4441 255		0
4433 554		00	4441 433	Ti	00
4433 742		00 N	4441 591		00
4433 948	Fe	1	4441 718		00
4434 057		000	4441 881	V-	3 N d?
4434 168	Ti	0 N d?	4442 127		00 N
4434 361		000 N	4442 241		000
4434 504		00	4442 421		000
4434 605		0	4442 510	Fe	6
4434 810		00 N	4442 579		000
4434 918		000	4442 751		0000
4435 129 s	Ca	5	4442 842		000
4435 321	Fe	2	4442 996	Fe	1
4435 493		00 N	4443 161	Zr <sup>+</sup>	0
4435 605		00 N	4443 365	Fe	3
4435 851 s	Ca	4	4443 459		000

## 56 TABLE OF SOLAR SPECTRUM WAVE-LENGTHS

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4443 723		000 N	4452 903		00
4443 976	Ti <sup>+</sup>	5	4452 967		00
4444 133		0000	4453 171	Mn	1
4444 243		000	4453 328		00
4444 385	V Ti <sup>+</sup>	0	4453 486	Ti	2
4444 566	<del>Ti</del> Ti <sup>+</sup>	00	4453 692		00 N
4444 728		2	4453 876	I <sub>1</sub>	1
4444 862		00	4454 004		000
4445 228		000 N d?	4454 164		000
4445 479		000 N	4454 274		000
4445 641	Fe	1	4454 387		000
4445 844		00 N d?	4454 552	Fe	3
4446 019		000 N	4454 700		000
4446 238		0000 N	4454 836		00
4446 409		00	4454 953 s	Ca, Zr	5
4446 566		00	4455 193	Mn	1
4446 704		0000	4455 342		000
4446 795		000	4455 485	Mn, Ti	2
4447 008	Fe	2	4455 615		000 N
4447 052		0000	4455 710		000 N
4447 190		0000	4455 815		000 N
4447 302	Mn, Fe	2	4455 980	Mn	2
4447 519		00 N d?	4456 064 s	Ca	3
4447 718		000 N	4456 225		000
4447 892 s	Fe	6	4456 338		000
4447 952		00	4456 497	Fe	1
4448 184		000 N	4456 625		000 N
4448 455		000 N	4456 794 s	Ca	2
4448 607		000 N	4456 945		000
4449 111		00 N	4457 040		000
4449 313	Ti	2	4457 207	Mn	0
4449 507		00	4457 330		000
4449 630		00	4457 435		00
4449 882		00	4457 600	Ti, V, Zr	2
4450 093		00 N d?	4457 712	Mn	2
4450 267		00 N	4457 835		0000
4450 398		000	4457 940	V	00 N
4450 482	Zr Fe	1	4458 110		000
4450 654	Ti <sup>+</sup>	2	4458 239	Fe?	2
4450 794		000	4458 409	Mn	2
4450 925		00	4458 550		000
4451 087	Ti	1	4458 690	Cr	0
4451 279		000 N	4458 850		000
4451 521		000 N d?	4459 003		00 N
4451 752	Mn	3	4459 199	Ni	2
4451 997		000 N	4459 301	Fe	3
4452 171	V	0 N	4459 525	Fe, Cr	1
4452 311		0000	4459 670		000 N
4452 488		000	4459 779		000
4452 782		0	4459 922	V	1



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4460 063		000	4467 017		000
4460 164		000 N	4467 102	Co Zr	I
4460 276		000	4467 248		000
4460 389	V	0	4467 373		000
4460 462	Mn	I	4467 498		00
4460 525		0	4467 603		0000
4460 700		00 N d?	4467 721	Cr	00 N
4460 944		00	4467 997		00 Nd?
4461 093		000 N	4468 160		00 N
4461 242	Mn	I	4468 317		000 N
4461 365	Fe, Zr, Ni	I	4468 463		00 N
4461 545	Fe	0	4468 663	Ti	5
4461 592		00	4468 800		000
4461 818	Fe	4	4468 914		000 N
4461 983		000 N	4469 150		00 N
4462 165	Fe Mn	3 N d?	4469 316	Ti	I
4462 365		0	4469 441		0000
4462 525	V	00	4469 545	Fe	4
4462 621	Ni	I	4469 731	Co	0 d?
4462 750		0000	4469 873	V	00
4462 860		00	4469 971		0000
4462 933		00	4470 100		000
4463 060		000	4470 300	Mn	I
4463 152		00	4470 477		000 N
4463 300		00	4470 648	Ni-Zr	2
4463 425		00 N	4470 799		000
4463 569	Ti-Ni	0	4470 875		000
4463 698		00	4471 017	Ti	I
4463 843	Ti	0000	4471 166		000
4463 997		0000 N	4471 250		000
4464 138		0000	4471 408	Ti	0
4464 389		000	4471 571		000
4464 503		000	4471 724		00 N
4464 617	Ti?	2	4471 846		0
4464 844	Mn	2	4471 971		00
4464 938		I	4472 076		0000
4465 069		00	4472 241		000
4465 143		00	4472 371		000
4465 295		00 N	4472 578		00 N
4465 385		000 N	4472 705		00 N
4465 519	Cr	0	4472 884	Fe	I
4465 667		000	4472 967	Mn	0
4465 775		00 N	4473 095	Ni?	0
4465 975	Ti	I	4473 300		000
4466 147		00 N	4473 385		000
4466 333		00 N	4473 550		000
4466 415		000	4473 633		000
4466 548	Ni	0	4473 798		000
4466 727	Fe	5	4473 927		00
4466 886		000	4474 001		00

Wave-length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4474 213		00	4482 170		000 N
4474 333		000	4482 338	—, Fe	5
4474 566		00	4482 438	Fe	3
4474 737		00	4482 603		0000
4474 912		00	4482 704		000 N
4475 026	Ti	0	4482 904	Ti-Fe	1
4475 175		000	4483 039	Cr	00
4475 260		000	4483 193		0000
4475 335		0000	4483 346		0000
4475 470	Cr	00	4483 513		0000
4475 633		000 N	4483 706		0000
4475 886		000 N	4483 825		0000
4476 185	Fe	4	4483 942		0
4476 253	Ag	3	4484 078	Co	0
4476 399		0000	4484 250		000
4476 596		000	4484 392	Fe	4
4476 804		000	4484 555		000
4477 028		000	4484 667		00
4477 228		00	4484 859		000
4477 397		000 Nd?	4484 993		000
4477 635		00 N	4485 122		000
4477 810		000 Nd?	4485 244		000
4478 015		000 N	4485 373		000
4478 190		0	4485 586		000
4478 306		000	4485 701		000
4478 486	Fe Co	00 N	4485 846	Fe	3
4478 792		00 N	4486 003		000
4478 982		00 N	4486 140		0
4479 163		00 N	4486 286		000 N
4479 404		00	4486 387		000 N
4479 553	Mn	0	4486 488		000 N
4479 775	Fe	1	4486 762		00 N
4479 879	Ti	00	4486 914		000
4480 015		000 N	4487 076		0
4480 133		0	4487 168		00
4480 308	Fe	1	4487 420		00
4480 440		00	4487 530		00
4480 548		000	4487 685		00
4480 633		0000	4487 916		0
4480 752	Ti, Ni	0 N	4488 034		00
4480 868		0000	4488 108		000
4480 990		0	4488 218	Fe-Cr	0
4481 195		00	4488 305		1
4481 298		0	4488 493		1
4481 438	Ti	1	4488 687		000 N
4481 515		0	4488 852		000
4481 647		0000 N	4488 928	V	0000
4481 782	Fe	1	4489 075	Fe	1
4481 940		000 N	4489 262	Ti	0
4482 078		000 N	4489 351		2

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4489 505		00	4497 268		000
4489 630	Cr	0	4497 429		000
4489 766		00	4497 571		000
4489 911	Fe	4	4497 842	Li	0 N
4490 092		000	4498 030		000
4490 253	Mn Fe	3 N	4498 265		000
4490 398		00	4498 467		00 N
4490 561		000	4498 725		00 N
4490 701	Ni	0	4498 897	Cl	0
4490 778		00	4499 066 s	Mn	1
4490 942	Fe	2	4499 201		0000
4490 975		0	4499 310 s		1
4491 113		0000	4499 525		000 N
4491 272		000	4499 666		000
4491 377		000	4499 881		0000
4491 570		2	4500 122	Mn	000
4491 823	Cr-Mn	0	4500 451	Cr	0
4492 016	Cr	00	4500 537		00
4492 139		000	4500 669		000
4492 278		000	4500 807		00
4492 475	Cr, Fe	0	4500 932		000
4492 700		00	4501 114		000
4492 846		1	4501 264	Cr, Mn	0
4493 016		0000	4501 448 s	Li,	5
4493 132		000	4501 622		00 N
4493 391		000	4501 813		00 N
4493 543		00	4501 946		0 N d?
4493 695		1	4502 157		00 N
4493 917		00 N d?	4502 217		0000
4494 118		0	4502 388	Mn	2
4494 222		1	4502 603		00
4494 356		00 N	4502 764	Fe?	0
4494 548		00	4502 925		000
4494 656		00	4503 046		0000
4494 738 s	Fe	6	4503 228		000
4494 903		000	4503 476		000
4495 031		000	4503 519		000
4495 182	Ti	00	4503 654		000
4495 426		00	4503 926		00
4495 590		0 N	4504 042	Mn	00
4495 738		0	4504 224		0000
4495 921		000 N	4504 371		000 N
4496 125		1	4504 707		0000
4496 318	Ti	1	4504 898		00
4496 409		00	4505 003	Fe	1
4496 541		0000	4505 196		00
4496 676	Mn	00 N	4505 404		00 N
4496 826		000	4505 647		0000
4497 023 s	Cr	3	4505 959		00
4497 138	Zr	0	4506 092		000

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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4506 259	Ba?	00 N	4514 358	Fe, Co	I
4506 497		00	4514 486		000
4506 618		000	4514 594	Cr	I
4506 776		00	4514 662		0
4506 907		00	4514 817	h 2c	000
4507 009		00	4514 957		00 N
4507 139		0000	4515 134		000
4507 266		0000	4515 273		0000
4507 396		0	4515 342		0
4507 560		00	4515 508		3
4507 711		0000	4515 606		00
4507 919		00	4515 763		00 Nd?
4508 027		00	4516 037		00 N
4508 177		00	4516 255		000 N
4508 250		00	4516 437		0 N
4508 455 s	Fe?,-	4	4516 628		000
4508 638		000	4516 826		0 N
4508 716		000	4517 094	Co	000 Nd?
4508 855		0	4517 255		000
4509 063		000	4517 321	Fe	0
4509 294		000	4517 471		0000
4509 456		0 N	4517 539	Ti	000
4509 616		0	4517 702		3
4509 758		000	4517 764	Ti	000
4509 904		I	4517 923		000
4510 161	In	00 N	4518 004	Ti	000
4510 344		0000	4518 198		3
4510 434		0000	4518 349	Ti	000
4510 708		000	4518 506		I
4511 000		0	4518 612	Ti	00
4511 233		00	4518 753		0
4511 345		00	4518 866	Ni	0
4511 516		00 N	4519 027		000
4511 728	Cr	00 N	4519 148	Fe?,-	000
4512 063		I	4519 465		000
4512 227	Ti	00 N	4519 624	Ni	0000 N
4512 439		0	4519 806		00
4512 602	Ni	000	4520 009	Fe?,-	00 N
4512 663		000	4520 157		0
4512 732	Ti	000	4520 282	Cr	000
4512 906		3	4520 397		3.
4513 051	Ni	000	4520 565	Cr	000
4513 164		0	4520 701		00 N
4513 385	Ni	000 N	4520 970	Cr	00 N
4513 491		000	4521 132		000 N
4513 603	Ni	0	4521 304		0
4513 754		00	4521 446	Cr	000
4513 886	Ni	00	4521 598		000
4514 038		0000	4521 834	Cr	000 N
4514 078		000	4522 053		00 N

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4522 195		00	4529 849	Fe	1
4522 286		00	4530 020	Cr	0
4522 418	La	0000	4530 172		000 N
4522 539		00	4530 275		000 N
4522 691	Fe?	0	4530 506		000 N
4522 802	<i>h 2c</i>	3	4530 668		00 N
4522 974	Ti	2	4530 866	Cr	0
4523 116		000	4530 910	Cr	1
4523 250		0	4531 123	Fe?, Co	2
4523 412		000 N	4531 327	Fe	5
4523 572	Mn?	1	4531 518		0000
4523 751		000 N	4531 625		0000
4523 910		000 N	4531 801	Fe	2
4524 090		00	4531 974		0000
4524 262		00	4532 075		000
4524 393		00	4532 306		000
4524 584		0000	4532 485		000 N
4524 685		0000	4532 743		000 N
4524 856		0	4532 944		00
4525 009		00	4533 133		1
4525 110		0	4533 219		0
4525 314	Fe	5	4533 419	Ii	4
4525 412		000	4533 583		0000
4525 783		000 N	4533 710		000 N
4526 031		0	4533 887		00 N
4526 269	Cr	0	4534 139	Ii Co	6
4526 431		000	4534 340		1
4526 579		1	4534 484		000
4526 632	Cr	2	4534 646		000
4526 732	Fe	1	4534 788		000
4526 887		0000	4534 953	Ti	4
4526 955		0000	4535 152		000 Nd?
4527 101	Ca?	3	4535 310	Cr	0
4527 332		000 N	4535 491		00
4527 490	Ti	3	4535 615		000
4527 632		0	4535 741	Ti	3
4527 807		000	4535 879	Cr	1
4527 954		0	4535 909	Zi	0
4528 097		000 N	4536 094	Ti	2
4528 310		00 N	4536 222	Ti	2
4528 473		000 N	4536 377		0000
4528 647		0 N	4536 532		00
4528 798	Fe	8	4536 675		00
4528 929		0	4536 853		0000
4528 990		0	4537 075		000
4529 185		000	4537 389		00 N
4529 394		000	4537 592		00
4529 482		000	4537 845		0
4529 656		1	4537 986		000
4529 728		1	4538 138		00 N

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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4538 351		000 N	4545 861		000
4538 539		00	4545 983		000
4538 634		000	4546 129	Fe, Cr	3
4538 770		00 N	4546 276		000
4538 928	Fe	0	4546 428		000 N
4539 013	Fe	0	4546 645		00
4539 124		00	4546 848		00
4539 263		00	4546 975		0000
4539 424		00	4547 101	Ni	1
4539 565		000 N d?	4547 192	Fe	2
4539 759		00	4547 401	Ni	0
4539 946	Cr	0 N	4547 587		000
4540 167		00 N	4547 675		000
4540 385		00	4547 815		000 N
4540 446		0000	4548 024	Fe	3
4540 575		00	4548 165		0000
4540 672	Cr	2	4548 301		00
4540 880	Cr	2	4548 412		000
4541 043		00	4548 614		00
4541 236	Cr	0	4548 756		00
4541 352		000	4548 938	Ti	2
4541 483		0	4549 069		000
4541 690	Cl	2	4549 187		000
4541 823		000	4549 273		000
4541 976		000	4549 360		00
4542 113		00	4549 450		00
4542 234		000	4549 642	Fe	2
4542 400	Zr	0 N	4549 808	Ti Co	6 d?
4542 600	Fe	1 N	4549 990		0
4542 785	Cr	0	4550 162		000 N
4542 876		0	4550 293		0
4543 012		0000	4550 445		00
4543 202		000	4550 601		000
4543 402		00	4550 743		000
4543 525		0000	4550 942	Fe?	2
4543 900		00	4551 139		000
4543 990	Co	0	4551 261		000
4544 190		1	4551 399	Ni	0
4544 365		000	4551 458		000
4544 444		0000	4551 691		000 N
4544 655		00 N	4551 824		0
4544 788	Cl	1	4552 018		00 N d?
4544 864	Ti	3	4552 314		0
4545 008		00	4552 460		0
4545 142		00 N	4552 632	Ti	2
4545 311		1	4552 725	Fe	1
4545 507	Cr-V	0	4552 824		000
4545 568		00	4553 065		000 N
4545 713		000	4553 219		00
4545 770		000	4553 346	Ni	0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4553 546		000 N d <sup>2</sup>	4562 541		0
4553 796		0000 N	4562 649		0000
4554 009		0000	4562 814	T <sub>1</sub>	00
4554 211 <sup>2</sup> s	Ba	8	4563 059		000 N
4554 423		0000	4563 413		00
4554 484		0000	4563 599	T <sub>1</sub>	00
4554 626		1	4563 939 s	T <sub>1</sub>	4
4554 707		000	4564 069		00
4554 869		000 N	4564 203		0000
4555 007		00	4564 352		00 d
4555 162		2	4564 511		00
4555 264		00	4564 629		0000
4555 468		00 N	4564 750		00
4555 662	T <sub>1</sub>	3	4564 875		0
4555 830		000	4565 002	Fe	0
4555 910		00	4565 215		000 N
4556 063	<del>Fe</del>	3	4565 296		00 N
4556 306	Fe Cr	4	4565 488	Fe	0
4556 549		0000 N	4565 597		00
4556 719		0000 N	4565 688	Cr	3
4556 934		0000 N	4565 842	Co Fe	2
4557 107		0	4565 905		00
4557 262		000	4566 031		000
4557 457		0 N	4566 198		00 N
4557 689		0000 N	4566 414		00 N
4557 927		00	4566 555		0000
4558 060		00	4566 693	Fe	1
4558 162		0000	4566 834		0000
4558 285		0	4567 046	Fe	1
4558 402		00	4567 168		00
4558 640		00	4567 345		0000
4558 827	Cr?	3	4567 391		0000
4558 949		000	4567 584		00 N
4559 106		0000	4567 755		000
4559 526		0000	4567 917		0000
4559 728		0000	4568 221		0000
4559 980		0000	4568 499		0
4560 102	N <sub>1</sub> , F <sub>1</sub>	0	4568 777		00
4560 266	Fe	2	4568 940	Fe	1
4560 457		00	4569 034		0
4560 589		00	4569 243		00 N
4560 740		000	4569 425		000 N
4560 892		00	4569 536		00 N
4561 044		00	4569 693	Cr	00
4561 145		00	4569 788	C <sub>1</sub>	0
4561 368		00 N	4569 992		0000 N
4561 591		1	4570 199		00 N
4561 909		00 N	4570 559		000 N
4562 148		0000 N	4570 781		000 Nd?
4562 406		0000	4571 095		00 N

\*This line is either double or reversed in the Sun. The Ba line seems to coincide with the center

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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4571 275 s'	Mg	5	4580 080		000
4571 470		000 N d?	4580 228	Cr	3
4571 618		0	4580 326		0000
4571 720		0000	4580 463		000
4571 849	Cr	1	4580 590	V	1
4571 976		00	4580 762	Fe-Ni	1
4572 156 s	Ti	6	4580 911		000
4572 366		000	4581 055		00 N
4572 457		00	4581 221		00 N
4572 600		0000	4581 369		0
4572 766		00	4581 575	Ca	4
4573 041		0 N	4581 693	Co, Fe	4
4573 231		0000	4581 805		00 N
4573 828		0000	4582 007		000 Nd?
4573 960	Ba?	000	4582 250		000 Nd?
4574 168		00	4582 483		0 N
4574 396	Fe	1	4582 683		00 N
4574 537		0000	4582 851		000 N
4574 658		00 N	4583 011		1
4574 739		0000	4583 126		00
4574 899	Fe	2	4583 296		00
4575 075		00 N d?	4583 424		000
4575 286		00	4583 587		0
4575 402		0000	4583 749		00 N
4575 600		00 N	4583 892		00
4575 726	Zr	00 N	4584 018	Fe	4
4575 964		0	4584 168		00
4576 096		0000	4584 269		00
4576 268		000 N d?	4584 447		00 N
4576 512		2	4584 618		000
4576 686		00	4584 730		0000
4576 769		000	4584 900	Fe	1
4576 957		000	4585 001		2
4577 181		000 N d?	4585 118		00
4577 356	V	0	4585 257		00
4577 501		000	4585 368		000
4577 656		000 N	4585 519		0
4577 868		00	4585 772		000
4577 988		000	4585 874		00
4578 220		00 N d?	4586 047	Ca	4
4578 503		00	4586 155		0
4578 732 s	Ca	3	4586 315		00
4578 909 s	V	00 N	4586 408	Cr	1
4579 062		00 N	4586 552	V	1
4579 231		00 N	4586 716		000
4579 359		000	4586 896		000 N
4579 506		0	4587 169		00
4579 684		00 N d?	4587 308	Fe	2
4579 862	Ba?	00	4587 571		00 N d?
4579 994		0	4587 777		00 N



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4587 898		00	4596 128	N <sub>1</sub>	0
4588 052		000 N	4596 245	Fe	2
4588 180		00 N	4596 414		000
4588 381 s		3	4596 589	C <sub>1</sub>	1
4588 574		00 N	4596 753		00
4588 697		00 N	4596 857		000
4588 859		00	4597 080	Co	0 N
4589 193		00 N	4597 211		00
4589 468		00 N	4597 430		0
4589 686		000	4597 560		0
4589 912		000 N d?	4597 775		000 N
4590 126 s		3	4597 929		1
4590 246		0000	4598 050		1
4590 388		000	4598 186		0000
4590 516		000	4598 303	Fe	3
4590 664		000 N	4598 456		0000
4590 851		000	4598 547		00
4590 965		0	4598 612		00
4591 117		00	4598 792		000
4591 290		00	4598 918		0
4591 421		00	4599 109		000
4591 574	C <sub>1</sub>	2	4599 183		00
4591 693		1	4599 408	I <sub>1</sub>	00
4591 911		000 N	4599 618		0000
4592 027		00 N	4599 752		000
4592 231	C <sub>1</sub>	1	4600 018	Fe?	2
4592 393		00	4600 145		000
4592 534		00	4600 279	Cr	1
4592 707	N <sub>1</sub>	2	4600 383		00 N
4592 840	Fe	4	4600 541	N <sub>1</sub>	2
4592 990		0000	4600 737		00 N d?
4593 102		000	4600 932	C <sub>1</sub>	3
4593 355		00	4601 114		0
4593 543		000	4601 207	Cr	0
4593 704		1	4601 319		00
4593 883		000	4601 452		00
4594 002		0	4601 557		00
4594 113		0	4601 734		000
4594 297	V	2 N	4601 917		000
4594 459		000 N	4602 013		000
4594 590		00 N d?	4602 183 s	Fe	3
4594 820	Co	00 N	4602 356		0000
4594 964		0000	4602 565		0000
4595 067	N <sub>1</sub>	0	4602 717		0000
4595 227		00	4602 929		0000
4595 386		00	4603 126	Fe	6
4595 540	Fe	2	4603 282		000
4595 651		00	4603 525		0
4595 770	C <sub>1</sub>	0	4603 665		0000
4595 865		000	4603 799		00

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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4603 902		00	4612 794		00
4604 031		0	4612 925		000
4604 137		0	4613 137		00 N
4604 420		00 N	4613 386	Fe	3
4604 580		0000	4613 544	Cl, I a	3
4604 735	Fe ?	2	4613 738		000 Nd?
4604 863		000	4613 892		00
4605 025		00	4614 097		1
4605 171	Ni	3	4614 388	Fe ?	1
4605 278		000	4614 529		0000
4605 430		000 N	4614 713		00
4605 536	Mn	0	4614 761		00
4605 640		00	4614 914		00
4605 769		2	4615 114		0000 N
4606 017		00 N	4615 427		0000 N
4606 189		000 N	4615 632		000
4606 404	Ni, C	2	4615 743	Fe ?	1
4606 574		00 N	4615 896		00
4606 687		000 N	4616 114		00
4606 969		000 N	4616 305	Cl	4
4607 274		00 N	4616 472		000
4607 394		0000	4616 644		00 N
4607 510 s	Sr	1	4616 804		1 N
4607 687		000 N	4616 923		000
4607 831	Fe	4	4617 134		000
4608 037		000	4617 244		000 N
4608 305		000	4617 452	Li	3
4608 406		0000	4617 636		000 N
4608 700		000 Nd?	4618 046		00
4608 887		00 N	4618 150		00
4609 023		0000 N	4618 303		0000
4609 447		0	4618 536		00
4609 540		000	4618 688		00
4609 752		0000 N	4618 971	Fe-	4 d?
4609 833		000 N	4619 133		000 N
4610 088		0	4619 285		00 N
4610 267		0000	4619 468	Fe	3
4610 365		0	4619 607		0000
4610 771		000 N	4619 711	Cr	1
4611 118		000	4619 852		0000
4611 249		00	4619 963		00
4611 368 } s	Cl	0	4620 072		0000
4611 469 } s	Fe	5	4620 313		00
4611 664		000	4620 522		00 N
4611 816		00	4620 693	Fe	1
4612 000		000	4620 986		000 N
4612 138	Cr	00	4621 208		0000
4612 251		000	4621 299		000
4612 446		000	4621 482		0000 N
4612 646		000	4621 654		00

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4621 795		00	4630 306	Fe	4
4621 947		000	4630 582		000 N
4622 065	Cr	0	4630 740		0
4622 128	Cr	1	4630 958		00 N
4622 307		000 N	4631 212		0 N
4622 433		000 N	4631 385		000
4622 627	Cr	1	4631 512		0000
4622 733		000	4631 663		0
4622 929	Cr	0	4631 900		00 Nd?
4623 071		000	4632 129		00 Nd?
4623 279	Ti	2	4632 320	Cr	0
4623 476		00 N	4632 503		00 N
4623 759		0	4632 654		00 N
4624 053		000 N	4632 825		00 N
4624 265		00	4632 991		1
4624 443		000 N	4633 100	Fe	4
4624 594		00 N	4633 272		00 Nd?
4624 741		00 N	4633 432	Cr	0
4624 923		00 N	4633 555		000 N
4625 074		00 N	4633 722		00 N
4625 227	Fe	5	4633 950		0 N
4625 378		000 N	4634 187		0000
4625 489		00 N	4634 254		2
4625 613		00 N	4634 441		000
4625 947		00 N	4634 547		000
4626 096	Cr	0 N	4634 780		000
4626 198		000	4634 895	Fe?	1
4626 358	Cr	5	4635 048		00
4626 532		00 N	4635 210		000
4626 718	Mn	0	4635 352	V	00 N
4626 825		000	4635 480		0
4626 975		00	4635 598		0000
4627 190		000 N	4635 736		00
4627 392		00 N	4635 803		0
4627 547		0	4635 884		0000
4627 726		0	4636 027	Fe	2
4627 829		0000	4636 192		000 N
4628 032		0000	4636 339		00 N
4628 197		0000	4636 501		0
4628 335		0	4636 740		0000
4628 448		0000	4636 851		00
4628 637	Cr	00	4637 108		000
4628 860		00	4637 221		00
4629 092		00 N	4637 352	Cr	0
4629 248		00	4637 474		00
4629 521 s	Ti-Co	6	4637 685 s	Fe	5
4629 714		00 N	4637 845		0000
4629 844		000	4637 938	Cr	0
4629 979		00	4638 050	Ti	00
4630 125		000 Nd?	4638 193 s	Fe	4

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4638 709		00	4648 835 <sup>s</sup>	Ni	4
4638 879		00 N	4649 031	Cr	00
4639 132		0	4649 124		00
4639 353		00 N	4649 337		00 N
4639 538	Ti	2	4649 476		000
4639 679	Cr	0	4649 613	Cr	0
4639 846	Ti	2	4649 819		0 Nd?
4640 119	Ti	1	4649 992		0
4640 280		000	4650 193	Ti	0
4640 468		1	4650 296		000
4640 681		00	4650 488		0
4640 883		0000	4650 725		00
4641 147		00 Nd?	4650 985		00
4641 390		0	4651 121		00
4641 693		000 Nd?	4651 200		00
4641 851		000	4651 461	Cr	4
4641 179		00	4651 685		0000 N
4642 306		00	4652 045		0000 N
4642 424		00	4652 198		0000
4642 765		00 N	4652 343	Cr	5
4643 005		00	4652 447		0000
4643 235		000 N	4653 069		0000
4643 389		00	4653 216		0000
4643 475		00	4653 323		0000
4643 645 <sup>s</sup>	Fe	4	4653 485		000
4643 912		00 N	4653 551		00
4644 066		000 N	4653 677		00
4644 572		00 Nd?	4653 819		000
4644 703		00	4653 960		000
4645 368	Ti	0	4654 077		000
4645 483		000	4654 218		000
4645 671		0 N	4654 327		0
4645 819		000 N	4654 478		00 N
4645 965		00	4654 672	Fe	4
4646 058		000	4654 800	Fe	5
4646 168		000	4654 912	Cr	00
4646 347	Cr	5	4655 419		00 N
4646 552		0	4655 634		000 Nd?
4646 676	Cr	00	4655 832		0
4646 815		1	4655 967	Li	0
4646 962	Cr	0	4656 127		0000
4647 145		000 N	4656 228	Ti	0
4647 354		00	4656 365	Cr	0
4647 454		0	4656 481		000
4647 617	Fe	4	4656 644	Ti	3
4647 876		000 N	4656 815		000
4648 135		1	4656 992		000
4648 297	Cr	0	4657 154		1
4648 497		000	4657 380	Li?	2
4648 591		000	4657 554		00

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4657 625		000	4666 655	Cr	I
4657 766		I	4666 782		0
4658 034		00 N	4666 925		I
4658 217		000	4667 066		00 N
4658 343		0000	4667 159	Ni	I
4658 475		0	4667 339	Cr	00
4658 675		00 N	4667 424		0
4658 827		00 N	4667 626	Fe	4
4659 054		00 N d?	4667 768	Ti	3
4659 338		00 N d?	4667 941	Ni	I
4659 547		000 N	4668 099		000
4659 707		000 N	4668 243 }		2
4659 940		0000 N	4668 331 }	Fe	4
4660 145		00 N	4668 550		00 N
4660 247		00 N	4668 749		I N
4660 412		00	4669 017		000 N
4660 602		0	4669 164		000 N
4660 801		000	4669 354	Fe	3
4660 902		00	4669 504	Ci	I
4661 083		0	4669 568		000
4661 327		00 N	4669 700		000
4661 507		00 N	4669 829		00
4661 712		I	4670 001		000 N
4661 965		00 N	4670 155		000 N
4662 149	Fe?	I	4670 346	Ni	I
4662 278		000	4670 590		2
4662 390		0000	4670 732		00
4662 496		0000	4670 915		000
4662 693		0	4671 080		00
4662 930		0 N	4671 222		00
4663 354		0	4671 388		000
4663 492	Cr	I	4671 601		I
4663 587	Co	0	4671 742		00
4663 734		000	4671 858	Mn	0
4663 882		0	4672 087		000
4663 999	Cr	I	4672 209		00
4664 139		0	4672 370		000
4664 358		00 N	4672 509		3 N
4664 497		00 N	4672 710		000
4664 720		00 N d?	4672 805		000
4664 965	Cr	3	4673 012		I
4665 355		00	4673 144		000
4665 430		000	4673 347	Fe	4
4665 722		00	4673 460		I
4665 852		000	4673 617		00 N
4665 998		000	4673 818		00 N
4666 076	Ci	I	4673 962		00 N
4666 279		0	4674 131		0000
4666 387	Ci	0	4674 275		I N
4666 526		000	4674 484		0

# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS VI

By HENRY A. ROWLAND

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4674 648		ooo	4681 223		ooo
4674 829		o N	4681 382		oo
4674 933		o	4681 482		oooo
4675 053		ooo	4681 646		i
4675 294	I <sub>1</sub>	i N	4681 781		oooo N
4675 453		ooo	4681 918		ooo N
4675 569		oo	4682 088	T <sub>1</sub>	3
4675 785		o	4682 295	Fe?	i
4676 019		ooo	4682 529	Co	i
4676 188		oo	4682 746	Fe?	o
4676 338		oo	4682 940		ooo N
4676 409		oo	4683 134		ooo Nd?
4676 531		oo	4683 427		ooo N
4676 713		oo	4683 575		oo N
4676 829		ooo	4683 745 s	Fe	3
4677 096	T <sub>1</sub>	oo	4683 882		oooo
4677 259		oo	4684 001		oooo
4677 415		ooo	4684 155		oo
4677 604	T <sub>1</sub>	oo	4684 392		oo N
4677 775		o	4684 532		oo N
4677 897		ooo	4684 702		oooo
4678 046		ooo	4684 774	Ce	o
4678 170		ooo	4684 924		ooo N
4678 347 s	Cd	3 N	4685 058		ooo N
4678 593		oo	4685 208		o
4678 706		oo	4685 452	Ca	2 N
4678 798		oooo	4685 673		ooo N
4679 027 s	Fe	6	4685 870		oo N
4679 249		ooo	4686 028		oo N
4679 409		2 N	4686 180		ooo
4679 594		ooo N	4686 296		oooo
4679 751		oooo N	4686 395 s	Ni	3
4679 995		oooo	4686 544		ooo
4680 157		ooo	4686 804		oo N
4680 317	Zn	i	4686 924		oo N
4680 480		i	4687 114		oo Nd?
4680 658	Cr	i	4687 358		oo
4680 745		o	4687 485		o
4680 926		oo	4687 568	Fe?	2
4681 037	Cr	o	4687 712		oooo

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4687 850		00	4696 809		00
4687 981	Zr	0	4696 930		000
4688 117		000 N	4697 101		00
4688 357	Fe	2	4697 230	Cr	1
4688 554		0	4697 469		00
4688 651		000	4697 578		0
4688 862		0 N	4697 791		00
4689 236		00	4697 983		000
4689 388		000	4698 256		000 Nd?
4689 540	Cr	2	4698 451		00
4689 676	Fe?	1	4698 579	Co	0
4689 793		0000	4698 641	Cr	1
4689 935		00 N	4698 798	Cl	1
4690 149		000 N	4698 946	Ti	1
4690 317 s	Fe?	4	4699 127		00
4690 555		0	4699 309		000 N
4690 734		000	4699 511		4
4690 977	Li	00	4699 762		00
4691 149		000 N	4699 899		00 N
4691 372		000	4700 029		000
4691 523 } s	Li	1	4700 165		000
4691 602 }	Fe	5	4700 337		4
4691 777		1 N	4700 473	Fe?	000
4691 954		00 N	4700 614		00
4692 144		00 N	4700 795	Cl	0
4692 394		00 N	4700 989		0000 N
4692 699		00 N	4701 090		00 N
4692 829		0 N	4701 231	Fe? '1'	1
4693 022		00 N	4701 345	Mn	00
4693 149		000 N	4701 535		1
4693 373	Co	0 N	4701 714	Ni	1
4693 513		000 N	4701 894		000
4693 852	Ti	0	4702 083		0 N
4693 964		000	4702 310		00
4694 125	Ni, Cl	1	4702 473		0
4694 298		0 N	4702 779		0
4694 478		000	4703 177 s	Mg	10
4694 632		00 N	4703 666		0000 N
4694 830		00 N d?	4703 768		00
4695 042	Fe?	1	4703 994 s	Ni	3
4695 078		00	4704 195		000
4695 331	Cl	0	4704 365		00 N d?
4695 625		0 N	4704 587		00
4695 782		00	4704 658		0
4695 926		00	4704 850		0000
4696 032		00	4704 962		0000
4696 203		00	4705 131	Fe	4
4696 444		00 N	4705 325		0000
4696 515		00	4705 425	' Fe?	000
4696 687		00	4705 641		0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4706 099		00	4717 494		00
4706 278		00	4717 756		0
4706 484		00	4717 891		000
4706 730	V <sub>1</sub>	0	4718 065		00
4707 249		000	4718 601	Cl	3
4707 457	-Fe	5 d?	4718 766		000
4707 672		2	4719 012		000
4707 937		00	4719 407		00
4708 196	Cr	2	4719 690		0
4708 463		000 N	4719 862		000
4708 636		000 N d?	4720 035		000
4708 846		2	4720 318		00
4709 153	Γ <sub>1</sub>	1	4720 571		0000
4709 271	Fe	3	4720 757		000
4709 507		000 N d?	4720 996		000
4709 680		000 N	4721 179	Fe?	2
4709 896	Mn	2	4721 310		000
4710 043		0000 N	4721 498		000
4710 252		000 N	4721 705		0000
4710 368	T <sub>1</sub>	00	4721 927		0000
4710 471	Fe	3	4722 155		000
4710 737		000 N	4722 342 s	/n	3
4711 197		000 N	4722 464		000
4711 665	Fe?	0	4722 646		0000
4711 804		000	4722 797	I <sub>1</sub>	0
4712 260	N <sub>1</sub>	0	4722 940		00
4712 433		00	4723 061		0000
4712 677		00	4723 179		000
4712 883		00	4723 294	Cl	00
4713 151		0000 N	4723 359	T <sub>1</sub>	00
4713 361		00	4723 527		000
4713 697		0000 N	4723 628		0000
4713 989		00	4723 932		000
4714 248		0	4724 078		000
4714 381		00	4724 592		0
4714 548 } s		1	4724 718		000
4714 599 }	N <sub>1</sub>	6	4725 033		000 N
4714 730		0000	4725 278		0000
4714 909		0000	4725 647		00
4715 089		000	4725 764		000
4715 280		0000	4726 133		00
4715 474	C?	00	4726 327	Fe?	0
4715 631		0000	4726 517		000
4715 783		000	4727 181		000
4715 946	N <sub>1</sub>	4	4727 337	Cr	0
4716 076		000	4727 452		00
4716 319		0000 N	4727 582	Fe	3
4716 686		000	4727 676 } s	Mn	2
4717 015		00	4728 032		00
4717 306		0000	4728 132		00



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4728 349		0	4739 140		0000
4728 595		0000	4739 291	Mn	3
4728 732	Fe	4	4739 473		0000
4728 966		0000	4739 635		00
4729 207	Fe?	1	4739 839		0000 N
4729 381		0000	4740 099		0000 N
4729 460		00	4740 349	Ni	00
4729 864	Fe? Cr	1	4740 530	Fe?	1
4730 042		0000	4740 668		0
4730 212		2	4741 131		1
4730 583		000	4741 260	Fe?	1
4730 897	Cr	1	4741 538		0000
4731 177		0	4741 718	Fe	3
4731 356	Li	000	4741 979		0000
4731 466		0000	4742 125		0000
4731 651	Fe?	4	4742 307		000
4731 841		0000	4742 482		00
4731 984	Ni	1	4742 730		00
4732 228		000	4742 979	Ti	1
4732 353		000	4743 121		000
4732 501		000	4743 289		000
4732 640	Ni	1	4743 481		0000
4732 995		000	4743 674		0000
4733 126		0000	4744 008		000
4733 400		000	4744 301		0000 N
4733 604	Ti	00	4744 573	Fe?	3
4733 779	Fe	4	4744 826		000
4733 936		0000	4745 020		0000
4734 169		000	4745 131		000
4734 283	Fe?	1	4745 325		00
4734 361		0000	4745 500	Ca	00
4734 612		000	4745 890		0000
4734 763		00	4745 992	Fe	4
4734 847		0000	4746 144		0000
4735 019		000	4746 305		000
4735 181		0000	4746 457		00
4735 492		000	4747 469		0000
4735 625		000	4747 868		000
4735 843		000	4748 015		0000
4736 031	Fe	3	4748 167	Na?	000
4736 210		000	4748 325	Fe?	4
4736 411		0000	4748 552		0000
4736 677		000	4748 734		0000
4736 963	Fe	6	4748 922		000
4737 145		000	4749 443		0000 N
4737 297		0000 N	4749 849	Co	0 Nd
4737 540	Cr	2	4750 139	Fe?	1
4737 817	Fe?	1	4751 279		0
4737 945		0000	4751 548		0000
4738 522		0000 N d?	4751 738		000

Wave-length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4752 012	Na?	00	4765 652		2
4752 125		0000	4765 851		0000
4752 289	Ni	2	4766 050	Mn	3
4752 471		0000	4766 621	Mn	4
4752 613	Ni	3	4766 827	Cr	000
4753 087		000	4766 966		00
4753 560		0000	4767 066		000
4754 225 s	Mn	7	4767 339	Fe?	0000
4754 549	Co	00	4767 471		0000
4754 949	Ni	1	4768 049	Cr	00
4755 342		00	4768 276	Co	000
4755 463		000	4768 519		3
4755 714		0000	4768 595	Fe	2
4755 889		00	4768 891		0
4756 019		000	4769 030		0000
4756 300	Cr	2	4769 222		0000
4756 552		000	4769 991	Ti	00 N
4756 705	Ni	3	4770 188		000
4756 913		0000	4770 881		000 Nd?
4757 213		0000	4771 279	Ti-Co	00
4757 509		000	4771 478		0000
4757 771	Fe	2	4771 664		3
4758 042		000 Nd?	4771 903	Fe	2
4758 308	Ti	1	4772 086		0000
4758 615		000	4772 359		0000
4758 918		00	4772 511		000
4759 107		00 N	4772 814		0000
4759 463	Ti	2	4773 007	Fe	4
4759 716		0000	4773 209		0000
4759 858		0000	4773 333		000
4759 959		0000	4773 471		0000
4760 113		000	4773 605		00
4760 261		00	4773 715		0000
4760 405		0000	4773 900		0000
4760 935		000	4774 153		000
4761 294		00 N	4774 728		0000
4761 439		000 N	4775 330		000
4761 718	Mn	3	4775 690		0000 N
4761 899		0000	4776 072		000
4762 567	Mn	5	4776 259	Fe	00
4762 820	Ni	1	4776 546	Co	0 d?
4762 969		0	4776 678		000
4764 108	Ti-Ni	4 d	4777 370		0000
4764 282		0000	4777 780		000
4764 479	Cr	00	4777 916		000
4764 720		0	4778 441	Ti	00
4764 839		0000	4778 767		0000
4764 945		000	4779 634	Fe	1
4765 183		000	4780 169	Co	2
4765 314		0000	4780 640		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4781 007		000	4796 852		0000 N
4781 201		0000	4797 090	V	000
4781 639		000 N d?	4797 230		000
4781 913		00	4797 352		000
4782 256		000	4797 544		0000
4782 467		0000	4797 813		0000
4782 998		000	4797 908		0000
4783 169		00	4798 169		0000
4783 613 s	Mn	6	4798 293	Ti	000
4784 048		000	4798 453	Fe	1
4784 189		0	4798 724		1
4784 898		0000	4798 921		0
4785 256		0000	4799 255		0000
4785 872		000	4799 437		0000
4786 145	Fe?	0	4799 598	Fe	1
4786 309		0000	4799 771		0000
4786 472	Ni	0	4799 984	Ti	1
4786 727	Ni	3	4800 080	Cd	00
4787 003	Fe	2	4800 322		000
4787 289		0000	4800 505		0000
4787 694		0000	4800 728		0000
4788 018	Fe?	1	4800 842	Ni-Fe	2
4788 403		0000	4801 027		0000
4788 952	Fe	3	4801 213	Cr	1
4789 122		0000	4801 421		0000Nd?
4789 324		000	4801 806		000
4789 528	Cr	2	4802 100		0000
4789 638		0000	4802 709		00
4789 849	Fe	3	4802 879		0000
4790 522	Cr	00	4803 072	Fe	2
4790 755		000	4803 233		0000
4790 937		000	4803 871		0000
4791 157		00	4804 232		000
4791 329		0	4804 706	Co?	0
4791 439	Fe?	1	4804 833		000
4791 787		0000	4805 035		0000
4792 393		0000	4805 191 } s		0
4792 500		00	4805 285 }		3
4792 702	Ti Cr	2	4805 476		0000
4793 045	Co	1	4805 606	Ti	0
4793 635		0000	4806 437		000
4793 927		0000	4806 523		000
4794 165		000	4806 801		0000
4794 549		00	4806 984		0000
4794 850		0000	4807 179	Ni	2
4795 024		0000	4807 411		000
4796 041		000	4807 725	Cr	000
4796 228		0000	4807 900	Fe	1
4796 373	Cr-Ti	00	4808 340		0
4796 551		0000	4808 733	Ti	00

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4854 060		0000	4866 465	N <sub>1</sub>	2
4854 346		000	4866 930		0000
4854 535		0000	4867 071		0000
4854 809		000	4867 724		00
4855 059	Fe	I	4867 822		0000
4855 348		000	4868 056	Co	I
4855 416		0000	4868 296		0000
4855 600	N <sub>1</sub>	3	4868 451	T <sub>1</sub>	0
4855 740		0000	4868 599		00 d ?
4855 859	Fe	2	4868 991		0000
4856 084		0000	4869 119		0000
4856 203	T <sub>1</sub>	I	4869 330		0000
4856 380		00	4869 652	Fe?	0
4856 580		0000	4870 230		00
4857 082		000	4870 323	T <sub>1</sub>	I
4857 280		000	4870 603		000 N
4857 579	N <sub>1</sub>	I	4870 829		0000 N
4857 744		0000	4870 996	N <sub>1</sub> , Cr	3
4857 967		000 N	4871 232		000
4858 323		0000	4871 404		0000
4858 443		000	4871 512	Fe	5
4858 508		0000	4871 867		0000 N
4858 675		0000	4872 112		I
4858 968		0000	4872 332	Fe	4
4859 221		000	4872 692		0000 N
4859 316	Fe?	0	4872 885		0000
4859 485		0000	4873 092		000
4859 667		0000	4873 276		0000
4859 928 s	Fe	4	4873 440		0
4860 203		0000	4873 630	N <sub>1</sub>	2
4860 401		00	4873 792		0000
4861 173		0	4873 935		00
4861 527 s F	H	* 30	4874 055		0000
4862 029	Cr	0	4874 196		0
4862 134		00	4874 379		0000
4862 368		000	4874 544		0
4862 550		0000	4874 693		0000
4862 732		000	4874 834		000
4862 783		0	4874 976	N <sub>1</sub>	0
4863 277		000	4875 277		0000
4863 431		0000	4875 215		0
4863 649		000	4875 381		0000
4863 833	Fe	2	4875 522		0000
4863 961		0000	4875 671	V	I
4864 160		0	4875 921		0000
4864 362		0000	4876 060	Fe	2
4864 505		I	4876 275		0000
4864 726		0000	4876 384		000
4864 919	V	0	4876 586		I
4865 798		I	4876 666		00

\* Width of F is 0.750.

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4876 855	Ca Fe	000	4888 822	Fe	2
4877 772		0	4889 011		0000
4878 033		000 N	4889 187	Fe?	3
4878 313		3	4889 294	Fe	2
4878 407		4	4889 830		0000
4878 690		0000	4890 397		0000
4878 902		000	4890 620		0000
4879 331		000	4890 948 s	Fe	6
4879 701		0000	4891 223		000
4879 883		0000	4891 332	Co	000
4880 225	Ti	000	4891 683	Fe	8
4880 501		0000	4892 047		000
4880 715		000	4892 138		0000
4881 128		000	4893 030	Fe	1
4881 448		0000	4893 228		000
4881 739	V	1 N	4893 434		0000
4881 904	Fe	2	4893 606		000
4882 129		0000	4893 751		0000
4882 336	Fe	3	4893 886		000
4882 518	Ti	000	4893 997		00
4882 670	Yt earth	000	4894 141		0000
4882 891		000	4894 551		000 N
4883 091		0000 N	4894 743		00
4883 313		0000 N	4894 977		0000
4883 651		000 N	4895 214		0000
4883 867		2	4895 841		000 N
4884 084		000	4896 625	Fe	1
4884 242	Mn	000	4896 763		000
4884 779		0	4897 379		0000
4884 984		000	4897 652		000
4885 124	Ti	000	4898 652		0000
4885 264		2	4898 798		0000
4885 418		0000	4899 702		000 Nd?
4885 620		3	4899 917		0000
4885 802		0000	4900 095 s	Ti La	2
4885 955		0	4900 301 s	Y?	2
4886 132	Cr	00	4900 455		0000
4886 268	Cr	0000	4900 648		0000
4886 359		0000	4900 808		000
4886 522	Fe	3	4901 002		00
4886 757		0000	4901 152	Ti	0
4886 899		000	4901 498		0000 N
4887 027		0000	4901 793		000 N
4887 187		2	4902 028		000 N
4887 381	Ni, Cr	2	4902 257		0000
4887 549	Fe?	00	4902 416		000
4887 715		0000	4902 562		000
4887 879		000	4903 278		0000
4888 344	Cr	000	4903 440 } s	Cr	0
4888 706		00	4903 502 }	Fe	5

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4954 472		0000	4971 531	Ni-	I
4954 782	Fe	I	4972 096		0000 N
4954 986	Cr	2	4972 357		0000
4956 152		000	4972 572		0000
4956 922		0000	4972 832		0000 N
4957 480 s	Fe	5	4973 088		0000
4957 650		0000	4973 281 s	Ti Fe	4
4957 785 s	Fe	8	4973 533		0000
4957 878		000	4973 827		0000
4958 207		0000	4974 431		000
4958 431	Ti	00	4974 537		0000
4959 320		0000	4974 642		0000
4959 381		00	4974 728		0000
4960 526		0000	4975 530	Ti	00
4961 039		0000	4975 588	Fe	00
4961 235		00	4975 729		0000
4961 564		0000	4976 314	Ni	0
4962 095		0	4976 508	Ni	I
4962 298		0000	4976 671		0000
4962 467	Sr?	000	4976 868		000
4962 751	Fe	2	4977 056		0000
4962 905		0000	4977 833	Fe	0
4963 087		0000	4977 891		0000
4963 245		0000	4978 104		0000 N
4963 725		0000	4978 289		000
4964 312		000	4978 372	Ti	00
4964 903	Ti	000	4978 544		0000
4965 107	Cr	I	4978 732 } s	Fe	0
4965 351	Ni	0	4978 785 }		3
4965 580		0000	4978 863		0000
4965 986		0000	4979 112		0000
4966 036	Mn	00	4979 232		0000
4966 270	Fe	4	4979 391		000
4966 460		000	4979 485		0000
4966 761		0000	4979 767	Fe	00
4966 979		0000	4979 885		0000
4967 449		0000	4980 012		0000
4967 571		0000	4980 143		0000
4967 700	Ni	00	4980 352 s	Ni-	4
4967 859		0000	4980 477		000
4968 080	Fe	3	4980 723		000
4968 569		00	4981 453		0000
4968 769	Ti	0	4981 550		000
4968 880	Fe	I	4981 912 s	Ti	4
4969 028		0000	4982 319		000
4970 098	Fe	3	4982 682	Fe	4
4970 291		0000	4982 994		2
4970 382		0000	4983 205		0000
4970 671	Fe	I	4983 433	Fe	3
4970 829		0	4983 644		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4983 777		0000	4998 742		0000
4984 028	Fe	3	4999 141		0000
4984 297	Ni	2	4999 297	Fe	0
4984 476		0000	4999 439		0000
4984 632		0000	4999 689 s	Ti, La	3
4984 806		00	5000 388		000
4985 432	Fe	3	5000 526	Ni-	2
4985 730	Fe	3	5000 721		0000
4985 941		0000	5000 917		000
4986 165	Cr	00	5001 165	Ti	0
4986 403	Fe	1	5001 387		0000
4987 088		00	5001 654		000
4987 260		0000	5002 044	Fe	5
4987 452		0000	5002 510		0000
4987 610		0000	5002 771		0000
4987 827		0000	5002 976	Fe	2
4988 030		0000	5003 924	Ni	0
4988 313		000	5004 056		0000
4988 535		0000	5004 226	Fe	0
4989 130	Fe	2	5004 393		0000
4989 325	Ti	00	5004 547	Cr	000 d
4989 730		0000	5005 068		00
4990 147		000	5005 347	Mn	0
4990 625	Fe	0	5005 581		000
4991 247	Ti	3	5005 675	Pb?	0000
4991 452	Fe, La	2	5005 896 s	Fe	4
4992 036		00	5006 306 s	Fe	5
4992 252		0000 N	5006 556		000
4992 461		000	5006 709		000
4992 657		0000	5006 870		000
4992 962		000	5007 398 } s	Ti	3
4993 173		0000	5007 461 }	Fe	2
4993 531		0	5007 912		00
4993 699		0000	5008 217		0000
4993 864	Fe	0	5008 409		0000
4993 926		000	5008 632		0000
4994 114		0000	5008 825		000
4994 316 s	Fe	3	5009 370		0000
4995 208		0000 N d?	5009 604		000
4995 586		00	5009 829	Ti, Co	00
4995 835		00	5010 006		0000 d?
4996 050		0000	5010 199	Ni	0
4996 375		0000	5010 396		00
4996 558		000	5010 506		000
4996 812		0000	5011 119	Ni	0
4997 024	Ni	1	5011 384		000
4997 161		0000	5012 252	Fe	4
4997 283	Ti	0	5012 335		1
4998 139		000 N	5012 490		0000
4998 408	Ni	1	5012 625	Ni	1

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5012 773		0000	5024 403		000
5012 875		0	5025 027	Ti	3
5013 479	Cr, Ti	2	5025 256	Ni	00
5013 644		0000	5025 482		00
5013 871	Ti	0	5025 749	Ti	1
5013 953		0000	5025 938		000
5014 100		00	5026 086		0000
5014 236		000	5026 670		0000
5014 369	} s	2	5027 305	Fe	3
5014 457		3	5027 406		00
5015 123		3	5027 531		000
5015 304		0000	5027 707		0000
5015 476		000	5027 798		0000
5016 220		000	5027 939	Fe	1
5016 340	Ti	2	5028 101		0000
5016 504		0000	5028 308	Fe	2
5016 659		00	5028 537		000
5016 864		0000	5028 719		0000
5017 060	Fe	0	5029 660		0000
5017 228		0000	5029 805	Fe	1
5017 370		0000	5029 994		000
5017 562		0000	5030 096		0000
5017 762	Ni	3	5030 218		0000
5017 997		000	5030 817		000
5018 210		0000 N	5030 960		00
5018 463	Ni	1	5031 058		0000
5018 629	Fe	4	5031 199		3
5019 059		0000 N	5031 361		000
5019 364		000	5031 939		0000
5019 664		0000	5032 092		00
5019 912		00	5032 252		0000
5020 208 s	Ti	2	5032 560		000 N
5020 675		000	5032 912	Ni	00
5020 873		0000	5033 305		0000 N
5020 998		00	5033 714		000
5021 177		000	5033 835		000
5021 328		0000	5033 960		000
5021 778	Fe	0	5034 354		000
5021 869		000	5034 530		0000
5022 108	Cr	000	5035 542	Ni	5
5022 240		0000	5035 846		000 Nd?
5022 414	Fe	3	5036 089	Ti	3
5023 052	Ti	2	5036 155	Ni	2
5023 221		0000	5036 332		0000
5023 372	Fe	0	5036 449	Fe	0
5023 53		0000	5036 645	Ti	2
5023 674	Fe	0	5036 909		0000 Nd?
5023 819		0000	5037 105	Fe	00
5024 010		000	5037 375		0000
5024 190		0000	5037 496		0000



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5037 669		0000	5049 769		{ 0000
5037 885		000	5049 860		{ 0000
5037 983		000	5050 008 s	Fe	6
5038 579	T <sub>1</sub>	2	5050 316		000
5038 774	Ni?	2	5050 626		000
5038 974		0000	5050 751		0000
5039 065		000	5050 919		000
5039 239		000	5051 145		00
5039 428	Fe	3	5051 488		000 N
5039 542	Ni	00	5051 683	Ni	1
5039 683		0000	5051 825	Fe	4
5039 951		000	5052 084	Ci	0
5040 138	T <sub>1</sub>	3	5052 338		0 N
5040 300		0000	5052 803		00
5040 422		000	5052 917		0000
5040 644		0000	5053 056	T <sub>1</sub>	0
5040 787	T <sub>1</sub>	00	5053 170		00
5040 908		0000	5053 301		0000
5041 069	Fe	3 d?	5053 477		000
5041 255	Fe	4	5053 756		00 N
5041 499	T <sub>1</sub>	00	5054 261		000
5041 633		00	5054 821	Fe	1
5041 795 s	Ca	2	5055 762		000
5041 936	Fe	4	5055 975		0000
5042 033	Ni	00	5056 169	Fe	00
5042 200		0000	5056 307		000
5042 367	Ni	1	5056 428		000
5043 475		000	5056 617		000
5043 761	T <sub>1</sub>	00	5057 021	Fe	1
5043 885		0000	5057 665	Fe, Ni	0
5044 011		0000	5057 875		0000
5044 212		000	5058 017		000
5044 394	Ni, Co Fe	3	5058 167	Fe	1
5044 945		0000 N	5058 421		000 N
5045 454		00	5058 674	Fe	00
5045 582	T <sub>1</sub>	00	5058 989		0000
5046 379		000 N	5059 110		0000
5047 107		000	5059 409		000
5047 301		000	5059 575		0000
5047 483		000 d	5059 964	Co	00
5047 726		0000	5060 111		0000
5047 898		0000	5060 258 s	Fe	3
5048 120		00	5060 476		0000
5048 242	Ni	0	5061 575		000
5048 409		00 N d	5061 703		000
5048 612	Fe	3	5061 882		00
5049 035	Ni-	2	5062 066		000 N
5049 192		0000	5062 285	T <sub>1</sub>	0
5049 384		0000	5062 530		0000
5049 607		0000	5063 355		00

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5063 479		000	5074 932	Fe	5
5063 699		0000	5075 154		0000
5063 927		0000	5075 341		0000
5064 058		0000	5075 480	Ti	00
5064 244	Ti	00	5075 716		0000
5064 557		0000 N	5075 989		0000
5064 836 s	Ti	3	5076 277		000
5064 989		0000	5076 450	Fe	3
5065 152		1	5076 504		000
5065 207	Fe	3	5076 666		0000
5065 380	Fe	2	5076 807	Ti	00
5065 556		0000	5076 950		000
5065 890		0000	5077 562		000
5066 078	Cr	000	5077 780		0000
5066 174	Ti	000	5078 013		0000 d
5066 446		0000	5078 246		000
5066 545		0000	5078 541		000
5066 908		00	5078 719		0000
5067 039		000	5078 891		0000
5067 336	Fe	3	5079 158	Fe	3
5067 679		000 N	5079 409	Fe	4
5067 874	Cr	0	5079 732		0000
5067 954	Co	000	5079 921	Fe	4
5068 485	Cr, Ti	0000	5080 144	Ni	1
5068 944 s	Fe	5	5080 288		0000
5069 267		000	5080 505		00
5069 592	Ti	000 d	5080 714	Ni	4
5069 802		0000	5080 966		0000
5069 971		0000	5081 111		0000
5070 165		00	5081 286	Ni	3
5070 313		000	5081 534		0000 N
5070 471		0000	5081 764		000
5070 615		0000	5081 942		000
5071 098		000	5082 019		000
5071 311		000	5082 231		0000
5071 435		0000	5082 363		0000
5071 666	Ti	0	5082 526	Ni	2
5071 969		000 N	5082 829		0000
5072 032		0000	5083 071		0000
5072 257	Fe	3	5083 205		000 Nd?
5072 479	Ti	0	5083 365		0000
5072 650		0000	5083 518 s	Fe	4
5072 849	Fe	2	5083 709		0000
5073 114	Cr	1	5083 877		000
5073 348		0000	5084 038		000
5073 637	Ti	00	5084 279	Ni	3
5073 776		0000	5084 590		0000
5073 924		000	5084 734		000
5074 244		0000 N	5084 876		000
5074 521		000	5085 017		000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5085 179	Ti	0000	5096 215	Ni Fe	0000
5085 341		0000	5096 357		000
5085 513		000	5096 660		0000
5085 668	Cd?	0	5096 762		0000
5085 856		000	5096 908		000
5086 078		0000 N	5097 038		0
5086 422		00	5097 175 } s		3
5086 570	Ti	000	5097 489		000
5086 794		0000	5097 668		0
5086 947		000	5097 884		0000
5087 104		0000	5098 046		0000
5087 239	Y?	0	5098 302	Fe Fe	00 N
5087 432		0000	5098 492		000 N
5087 601	Ni	I	5098 751		I
5088 019		0000 N	5098 885		3
5088 175		000	5099 104	Fe Ni	0000 N
5088 331	Ni	0	5099 251		0
5088 719		0	5099 497	Ni	I
5088 929		0000	5099 744		0000 N
5089 134	Fe Cr	0	5099 957		000
5089 387		000 N d?	5100 108		2
5089 541		0000	5100 413	Ni	0000
5090 004		0000	5100 636		0000
5090 236	Fe Cr	0000 N	5100 827		00
5090 391		000	5101 028		000
5090 569		0000	5101 108		000
5090 954 s		5	5101 251		000
5091 146		0000	5101 445		0000
5091 353		0000	5101 655		000
5091 477		0000	5101 790		000Q
5091 662		0000	5101 994		0000
5091 896		000	5102 184		0000
5092 058	Ni	00	5102 410		0000
5092 285		0000	5102 599	Ni	000
5092 483		00	5102 843		0000
5092 665		0000	5103 142		I
5092 977		000	5103 297		0000
5093 220		0000	5103 567	Fe	000
5093 513		0000	5103 721		0000
5093 623		0000	5103 909		000
5093 858		0000 N	5104 083		0000
5094 199		000 N	5104 204		0
5094 594		0	5104 366		0
5094 789		0000	5104 614		0
5095 117		00	5104 817		0000
5095 348		00 d?	5105 066		000
5095 512		00	5105 260	Fe	0000
5095 679	Ni	0000	5105 356		0000
5095 840		0000	5105 536		000
5096 031		000	5105 718 s		4

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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5105 918		0000	5117 071		000
5106 183		0000 N	5117 334		0000
5106 407		0000	5117 933		0000
5106 556		0000	5118 112	Mn	00
5106 623		000	5118 241		0000
5106 773		000	5118 352		0000
5107 047		0000	5118 529		0000
5107 619	Fe	4	5118 987		000 Nd?
5107 823	Fe	4	5119 292		00
5108 056		000	5119 368		0000
5108 149		0000	5119 555		000
5108 359		000	5119 820		0000
5108 563		00	5119 942		0000
5108 805		0000	5120 084		0000
5109 083		0000	5120 276		0000
5109 291		000 d?	5120 516		000
5109 475		0000	5120 592	Ti	0
5109 601	Ti	0000	5120 802		000
5109 827 s	Fe	2	5120 893		0000
5110 188		0000	5121 056		0000
5110 574 s	Fe	5 d	5121 197		0000
5110 938	Cr	00	5121 399		0000
5111 138		0000	5121 609		0000
5111 426		0000	5121 732	} s	Ni
5111 539		000	5121 825		Fe
5111 802		000	5122 156		0000
5111 912		0000	5122 299	Cr	000
5112 049		000	5122 481		0000
5112 458		000	5122 613		0000
5112 663		0000	5122 968	Co	000
5112 817		0000 N	5123 178		000
5112 944		0000	5123 390	Y	0
5113 153		000	5123 458		0000
5113 298	Cr	00	5123 641	Cr	000
5113 424		0000	5123 899	Fe	3
5113 617	Ti	0	5124 219		000
5113 920		0000	5124 364		0000
5114 195		0000 N	5124 560		000
5114 431		000 N d?	5124 785		00
5114 683		000 N d?	5124 939		0000
5115 367		0000	5125 300	Fe	3
5115 566 s	Ni	2	5125 423	Ni	1
5115 843		0000	5125 645		0000
5115 961	Fe	0	5126 012		0000
5116 045		0000	5126 167		0000
5116 217		0000	5126 371 s	Fe Co	2
5116 359		0000	5126 680		000
5116 643		0000	5126 856		000
5116 849		0000	5127 035		000
5116 944		000	5127 187		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5127 360	Fe, Ti	0000	5138 036	Fe Fe Cr	0000
5127 533 s		3	5138 130		0000
5127 858		00	5138 279		0000
5128 051		0000	5138 518		0000
5128 250		000	5138 690		0000
5128 382		0000	5138 890		000
5128 486		0000	5139 037		0000
5128 660		000	5139 189		0000
5128 807		0000	5139 427 s		4
5129 080		000	5139 644 s		4
5129 336	Ti?	3	5139 817	Cr	00
5129 546	Ni	2	5140 094		0000
5129 805	Fe	1	5140 336		0000
5129 990	Ni	0000	5140 553	C?	0000
5130 120		0000	5140 992		00
5130 304		0000	5141 193		0000
5130 543		00	5141 386		000
5130 757		000	5141 497		0000
5131 103	Fe	0000	5141 709	Fe	0000
5131 478		000	5141 918 s		3
5131 642		2	5142 074		0000
5131 771	C	0000	5142 279		0000
5131 942	Ni	1	5142 458		0000
5132 338	Fe	0000	5142 693	Fe	4 d?
5132 523		000	5142 958 s	Ni	2
5132 673		000	5143 111 s	Fe	3
5132 843		00	5143 288	C,- Cr, C	0000
5133 118		000	5143 511		000
5133 209		0000	5143 764		000
5133 364		000	5143 901		00
5133 654		000	5144 031		0000
5133 870 s	Fe	4	5144 203		0000
5133 988	C	0000 N	5144 543		000 N
5134 505	C,- C,-	0000	5144 758		000
5134 697		000	5144 847		00
5134 849		0000	5145 098		0000
5135 273		0000	5145 271	Fe	1
5135 355		0000	5145 403	Ti	0000
5135 752		000	5145 636		0
5135 880		000	5145 907		0000 N
5136 103	Fe	0000	5146 291	C,-	00
5136 270		00	5146 486	Ni	000
5136 443		000	5146 659 s		3
5136 625		0000	5146 945	Co	000 d?
5136 835		0000	5147 273	Ti C, C,- Fe	000
5136 969	Ni	000	5147 458		0000 N
5137 250		3	5147 652		0
5137 558		3	5147 871		000
5137 753		000	5147 992		000
5137 864	C,-	000	5148 222		2

# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS VIII

By HENRY A. ROWLAND

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5148 410	Fe	3	5157.376		0000
5148 627		0000	5157 783	-,C	0000
5148 851		000	5157 915	C,	0000
5149 013		000	5158.152		000
5149 267	C,	000	5158.701	(	0000
5149 392		000	5158.832	C'	0000
5149 512		0000	5159 026		0000 N
5149 685		0000 N	5159 231 s	Fe	2
5149 964		000	5159 452		0000
5150 363		00	5159.634	C,	0000
5150 525		0000	5159.776	C	0000
5150 736	,C	000	5159.946		0000
5150 842	C?	0000	5160.138		000
5151 020 s	Fe	4	5160.419	C,	00 N
5151 112	Mn	000	5160.554		0000
5151 344		0000 N	5161 006		0000 N
5151 628		0000 N	5161 194	C,	000
5152 087	Fe	3	5161 353	C,	0000
5152 361	Ti	0	5161 849	C'	0000
5152 700		0000	5161.910	C,	000
5153 129	-C?	000	5162.153	C?	0000
5153 337	C	0000	5162 449 h	Fe, C'	5
5153 414	Fe f <sub>u</sub>	1	5162 690	C	0000
5153 584		00	5162.902		0000
5153 687		00	5163.074	C,	0000
5153 848		000	5163.200	C,-	000
5153 985		0000 Nd?	5163.327		0000
5154 244 s	Ti Co	2	5163.585	C,-	000
5154 505	C	0000	5163.756	C,-	000
5154 579		000	5164.007		0000
5154 913		0000	5164.172	C	0000
5155 028		0000	5164.404	C,-	000
5155 303	Ni	1	5164 562		0000
5155 694	C,-	000	5164.724	Fe?	1
5155 935 s	Ni	2	5164.855	C	0000
5156.239		000	5164 950	C	0000
5156 530		000	5165.080	C,	000
5156 728	C	0000	5165.209	C	0000
5156 823	C,-	00 N	5165.297	C	0000
5157 163		0000	5165.416 s	C	0000

\* Head of carbon band.

TABLE OF SOLAR SPECTRUM WAVE-LENGTHS 91

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5165 588 s	Fe	2	5180 747		000
5165 746		0000	5181 041		0000
5166 133		0000	5181 334		000
5166 454	Cr-Fe	3	5181 498		00
b <sub>4</sub> 5167 497 s	Mg	15	5181 719		0000 N
5167 678 s	Fe	5	5182 010		000
5167 885		00	5182 123		0000
5168 123		0000	5182 518		0000
5168 360		000 Nd?	5182 761		0000
5168 832	Ni	1	5182 907		000
b <sub>8</sub> 5169 069 s	Fe	3	b <sub>1</sub> 5183 791 s	Mg	30
5169 220 s	Fe	4	5184 364		000
5169 469		00	5184 445	Fe	2
5169 664		0000	5184 738	Fe, Ni, Cr	1
5169 871		0000	5184 998		0000
5170 271		0000	5185 201		0000
5170 655		0000	5186 073	Ti	2
5170 767		000	5186 274		0000
5170 937	Fe	0	5186 497	Fe	000 N
5171 192		0000	5186 718		000
5171 778 s	Fe	6	5187 432		0000
5172 386		00	5187 620		000
b <sub>8</sub> 5172 856 s	Mg	20	5188 004		0000
5173 499		0000	5188 079	Fe	1
5173 652		000	5188 227		0000
5173 917 s	Li	2	5188 409		0000
5174 077		0000	5188 571		0000
5174 203		000	5188 863 s	Ti	2
5174 595		000 N	5189 018 s	Ca	3
5175 099		000	5189 300		000
5175 423		000	5189 503		0000
5175 575		000	5189 744		000
5175 923		000 Nd?	5189 948		000
5176 191	Co	000	5191 244		000
5176 305		000	5191 629	Fe	4
5176 735	Ni	1	5191 768		000
5176 954	V	000	5191 911		0000
5177 179		0000 N	5192 033		0000
5177 410	Fe	0	5192 155	Cr	00
5177 577	Co	00	5192 523	Fe	5
5177 784		0000	5192 659		000
5177 979		0000	5192 785		000
5178 156		0000	5192 924		0000 N
5178 644		000	5193.139 s	Ti	2
5178 970		00	5193 339		0000
5179 293		000	5193 500		0000
5179 695		0000	5193 669	Cr	000
5179 958		000	5194 027		0000
5180 233	Fe	1	5194 216	Ti	000
5180 572		000	5195 113	Fe	4

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5195 647	Fe	2	5210 555 s	Ti	3
5196 227	Fe	1	5211 015		000
5196 434		0000 N	5211 106		0000
5196 613	Cr	0	5211 367		000
5196 741	Mn	00	5211 700	Fe	00
5197 332	Ni, Mn	00	5211 976		0000
5197 540		0000 N	5212 398		000 N
5197 743		2	5212 503		0000
5197 954		0000	5212 859		0000
5198 108		0	5213 155		000 Nd?
5198 512		0000	5213 515		0000
5198 888 s	Fe	3	5213 977		000
5199 033		0000	5214 286	Cr	00
5199 766		000	5214 781		00
5199 879		000	5215 353 s	Fe	3
5200 355	Cr	00	5215 737		000 N
5200 590	V	0	5216 437	Fe	3
5200 989		0000 N	5216 648		00
5201 260	Ti	000	5217 552 s	Fe	3
5201 458		0000 N	5217 836		0000 N
5201 771		0000 N	5218 030		0000
5202 125		000	5218 085	Fe	0
5202 249		000	5218 369	Fe	1
5202 439 } s	Fe?	2	5218 675		0000
5202 516 }	Fe	4	5219 186		0000
5202 945		0000	5219 875	Ti	0
5203 118		0000	5220 045		0000
5203 658		000	5220 250		000
5204 414		0000	5220 358	Ni	0
5204 680 } s	Cr	5	5221 078		000
5204 768 }	Fe	3	5221 197	Cr	00
5205 113		0000	5221 928	Cr	0
5205 467		0000	5222 556	Cr	00
5205 897	V	0	5222 849	Ti, Cr	00
5206 215	Cr Ti	5	5223 033		0000 N
5206 372		00	5223 351	Fe	0
5206 712		000	5223 529	Ti	0000
5206 986		0000	5223 705		0000
5207 259		0000	5223 791		000
5207 791		000 N	5224 062		0000 Nd?
5208 038		0000	5224 239	Cr	000 N
5208 111	Ti	00	5224 471	Ti	0
5208 276		000	5224 712	Ti, Cr	00
5208 596	Cr	5	5224 885		0000
5208 776	Fe	2	5225 101	Cr	0
5209 779 x		0000	5225 198	Cr, Ti, Fe	00
5209 949		0000	5225 513		0000
5210 059		000	5225 695 s	Fe	2
5210 204		0000	5225 877		0000
5210 421		0000	5225 974	Cr	000



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5226 224		0000	5242 658 s	Fe	2
5226 364		0000	5243 346		000
5226 549		0000	5243 526	Cr	00
5226 707	Γ <sub>1</sub> -	2	5243 635		0000
5227 043	Fe-C <sub>1</sub>	3	5243 946	Fe	1
5227 362	Fe	5 d?	5244 702		000 N
5227 639		0000	5245 118		0000
5227 902		000	5245 801		0000
5228 049		0000	5245 901		0000
5228 268	Cr	000	5246 170		0000
5228 546		1	5246 310		0000
5228 727		0000	5246 733		0000
5230 030 s	Fe	4	5246 946		000
5230 225		0000	5247 229	Fe	1
5230 382	Co, Cr	00	5247 466	Ti	000
5230 554		0000	5247 737	Cr	2
5230 867		000 N	5248 091	Co	000 N
5231 151		0000	5248 550		000
5231 578		000	5249 163		0000
5232 681		000	5249 279	Fe	00
5233 005		0000	5249 593		0000
5233 122 s	Fe	7	5249 751		0000
5234 022		0000	5250 193		0000
5234 255		0000	5250 385 s	Fe	2
5234 380		000	5250 602		0000 N
5234 603		0000 N	5250 817 s	Fe	3
5234 791	1-2	2	5251 085		0000 N
5235 040		0000	5252 146	Fe	0
5235 202		0000	5252 276	Ti	000
5235 353	Co	000	5253 205		00
5235 557	Fe	1	5253 421		0000
5235 672	Ni	00	5253 633 s	Fe	2
5236 373		0	5253 854		0000 N
5236 549		000	5254 132		0000 N
5237 254		0000	5254 830		0000
5237 493	Cr?	1	5255 121	Fe	3
5238 011		0000	5255 295	Cr	0
5238 416		0000	5255 492	Mn	0 d?
5238 742	Ti	000 N	5255 687		0000
5239 137	Cr	00	5255 831		000
5239 992		1	5255 912		000
5240 310		0000	5255 973	Ti	0000
5240 523		0000	5257 100	Sr?	00
5240 639		000	5257 246		0000 N
5241 040		000	5257 529		0000 N
5241 347		0000	5257 814		0
5241 624		0000	5258 000		000 N
5242 094		0000	5259 261		0000 N
5242 238		000	5259 660		000 N
5242 450		0000 N	5259 912		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5260 142		000	5270 235		000
5260 438		0000	5270 438 s *	Ca	3
5260 561 s	Ca	0	5270 558 s	Fe	4
5260 840		0000	5271 228		00
5260 945		0000	5271 464		00
5261 669		0000	5271 796		0000
5261 876 s	Ca Cr	3	5272 017		0000
5262 130		000 N d?	5272 171	Cr	00
5262 321 s		1	5272 436	Fe	000
5262 419 s	Ca	3	5272 574		000
5262 631		0000	5273 339 s	Fe	3
5262 791		000	5273 558 s	Fe Cr	2
5263 056		00	5273 770		0000 N
5263 239		0000	5274 408		00
5263 486	Fe	4	5274 575		000
5263 669	Ti	000	5274 702		00
5263 890		000	5274 959		0000 N
5264 038	Fe	0	5275 148		0
5264 163		0000	5275 340	Cr	00
5264 329 s	Cr	4	5275 454		1
5264 415 s	Ca	3	5275 641		0000 N
5264 570		000	5275 762		0000
5264 759		000 N d?	5275 926	Cr	1
5264 976	Fe	0	5276 169 } s	Fe?	3
5265 146		0000 N	5276 237 }	-Cr?	2
5265 321	Cr	00	5276 344	Co	000
5265 423		000	5276 612		0000 N
5265 591	Co	0000	5277 047		000
5265 729 s	Ca	3	5277 480		00
5265 893 s	Ni-Cr	2	5278 420		00 N
5266 141	Ti	0	5278 747		0000
5266 246		000 N	5278 960		00
5266 482		000	5279 130		000
5266 639		000	5279 349		0000
5266 738 s	Fe	6	5279 481		000
5267 203		000	5279 843		00
5267 273		000	5280 048		0
5267 447		00	5280 239		00
5267 658		0000	5280 458	Cr	000
5267 825		000 N	5280 540	Fe	1
5268 355		0000	5280 799	Co	00
5268 515	Ni	0	5281 099		0000 Nd?
5268 670		000	5281 333		000
5268 784	Co	00	5281 491		00 N
5268 972		0000	5281 681		000 N
5269 125		000	5281 844		000
5269 586		00 N	5281 971 s	Fe	5
5269 723 s E <sub>2</sub>	Fe	8 d?	5282 339		0000
5269 863		000 N	5282 576	Ti	00
5270 076		0000	5283 331		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5283 613	Ti, Co	00	5300 152		00
5283 802 s	Fe	6	5300 578		000
5284 087		000	5300 735		0000
5284 281	Ti	1	5300 929 s	Cr	2
5284 453		0000	5301 094		0000
5284 601	Fe, Ti	00	5301 218	Co	00
5284 787		00	5301 485		000
5284 940		0000	5301 666		0000
5285 300	Ni	0	5302 048		000
5285 431		000	5302 225		000
5285 557		0000	5302 480	Fe	5
5285 819		000	5302 738		0000
5287 351	Cr	000	5302 829		000
5287 741		0000 N	5303 122		0000
5287 958		000	5303 401		0
5288 389		000	5303 591		000
5288 548		0000	5303 738		000
5288 705 s	Fe	2	5304 018		00
5288 974		000	5304 355	Cr	0
5289 446		000	5304 610		0000
5289 676		000	5304 735		000
5289 988		000	5305 167		000 d
5290 984		000	5305 602		0000
5291 820		000 N	5306 040		0
5292 388	Awv?	000 N	5306 331		0000
5292 569		0000	5306 665		000
5292 762	Fe	0	5307 039		0000
5293 044		000	5307 140		0000
5293 210	Awv?	00	5307 402		000
5293 341	Awv?	00	5307 541 s	Fe	3
5293 543		000	5308 385		0000
5293 946		0000	5308 599		0
5294 134	Fe	0	5308 863		00
5294 290		0000	5309 064		000
5294 579		0000	5309 357		0000
5294 726		00	5309 630		0000
5295 241		0000	5310 227		0000
5295 485	Fe	0	5310 417		000
5295 955	Awv?	00	5310 659		000
5296 243		000	5310 866		0
5296 657		0000	5311 102		000
5296 872 s	Cr	3	5311 310		0000
5297 407	Cr, Ti	000	5311 650		000
5297 555	Cr	2	5311 804		000
5298 194	Cr	1	5311 962		000
5298 455	Cr	4	5312 435		000
5298 672	Ti	0	5312 666		000
5298 957	Fe	0	5312 835		00
5299 005		0000	5313 031	Cr	0
5299 804		0000	5313 253		000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5313 422	Co	000 N	5328 747	Fe	2
5313 587		000	5328 919		0000
5313 758		1	5329 096		000 d?
5313 931		0000	5329 329	Cr	3
5314 447	Fe	0000 N	5329 975	Cr	0
5314 916		000 N	5330 179	Fe	2
5315 103		000	5330 748		000
5315 252		1	5331 377		0000
5315 960	Fe	000 N	5331 641	Co	00 d
5316 390		0000	5331 944		000
5316 572		0000	5332 545		000
5316 790 s	Fe	4	5332 849	Co, Fe	1
5316 906 } s	Co	0	5333 089 s	Fe	4
5316 958 }		2	5333 334		000
5317 249		0000	5333 432		000
5317 724		00 N d?	5333 832	Co	000
5318 215		0000	5333 949		000
5318 534		00 N	5334 140		0000
5318 777	Cr, Fe	0000	5334 403		000
5318 955		0	5334 520		000
5319 225		00	5335 050	Co	1
5319 392		000	5335 147		0000
5319 502		000	5335 547		0000
5319 999		00	5335 770		0000
5320 220	Fe	0	5336 356		000
5321 005		000 N	5336 478		0000
5321 293	Fe	2	5336 660		0000
5321 976	Mn	000 N d?	5336 792		0000 N
5322 227	Fe	3	5336 974	Th,	4
5322 994		000	5337 910		0
5323 687		0000	5337 946		00
5323 971		0000	5338 517		00 N
5324 274		0000	5338 727		000
5324 373 s	Fe	7	5338 927		000
5324 881		0000	5339 403		000
5325 460	Co	00	5339 609	Co	00
5325 569		0000	5339 719		000
5325 738		2	5339 878		0000
5326 139		000 N	5340 121	Fe	6
5326 331	Fe	1	5340 375	Co	00
5326 535		0000	5340 639	Cr	0
5326 682		0000	5340 852		000
5327 003		00	5340 962		0000
5327 445		000	5341 213	Fe	7
5327 917		0000	5341 337	Mn	1
5328 074		00	5341 514		00
5328 236	Fe	8 d?	5341 670		000
5328 367		000	5341 933		0000
5328 515	Cr	2	5342 055		0000
5328 696	Fe	2	5342 276		000

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↑  
 5313 422 is not listed.

TABLE OF SOLAR SPECTRUM WAVE-LENGTHS 97

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5342 409		000	5357 383		00
5342 713		000 d	5358 306		00
5342 890	Co	1	5358 476		0000
5343 148		0000	5358 668		0000
5343 310		0000	5358 853		000
5343 411		0000	5359 127		000 N
5343 570	Co	0	5359 389	Co	00
5343 622	Fe	2	5359 714		000
5344 646	Mn	00	5359 910		000
5344 767		000 N	5360 330		0000 N
5344 942	C1	00	5360 665		0000
5345 729		000	5360 903		0000
5345 991	C1	5	5361 115		0000
5346 274		00	5361 343		0000
5346 523		000	5361 565		000
5346 731	Fe	0	5361 697		000
5347 004		00	5361 813 s		1
5347 156		0000	5362 365		0000
5347 277		000	5362 944 s	Fe, Co	1
5347 500		0000	5363 058 s		3
5347 712		00	5364 359		000
5347 898		00	5364 615		000
5348 259		000	5365 069	Fe	5
5348 511	Cr	4	5365 416		0000
5348 947		000	5365 596	Fe	3
5349 283		000	5366 616		00
5349 473		0000	5366 827		000
5349 653 s	Ca	4	5366 950		000
5349 928	Fe	1	5367 669 s	Fe	6
5350 059	Mn	00	5367 062		0000
5350 281		00	5368 083		0000
5350 547		00	5368 311		0000
5350 688		0000 N	5368 490		000
5350 976		0000 N d?	5368 626		000
5351 261	T1	00	5368 741		000
5351 832		0000	5369 044		0000
5352 024		000	5369 125		0000
5352 234	Co	1	5369 348		0000 N
5352 421		0000	5369 550		000
5352 591		000	5369 782	Co T1	1
5353 178		000	5370 166 s	Fe	6
5353 350		0000 N	5370 522	C1	00 N
5353 571 s	Fe, Cr	3	5371 528	Ni	1
5353 702	Co	0	5371 656 } s	Cr?	4
5354 714		0000	5371 734 }	Fe	3
5354 916		0000	5372 121		000
5355 088		0000	5373 839		0000 N
5355 921		00	5373 905	Fe, Cr	2
5356 270		000	5374 142		0000
5357 178		000	5374 349		000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5374 610		000	5387 165	Fe, Cl	0
5374 962		000	5387 323		0000
5375 086		0000	5387 478		000 N
5375 371		000	5387 680	Fe	00
5375 516		000	5387 769	Cr	00
5376 068		000	5387 926		0000
5376 320		000	5388 192		000
5376 656		000	5388 360		0000
5376 867		0000	5388 550		00
5377 028	Fe	0	5388 713		000
5377 252		00	5388 989		000
5377 388		000	5389 371		000
5377 505		0000	5389 505		0000
5377 606		0000	5389 683 s	Fe	3
5377 800	Mn	2 N	5389 875		0000
5377 991		000	5390 047		00
5378 122		0000	5390 203		000
5378 426		000	5390 573	Cl	000
5379 338		0000	5390 725		0
5379 519		0000	5390 974		0000
5379 625		0000	5391 267		0000
5379 775 s	Fe	3	5391 660	Fe	2
5380 086		0000	5391 820	Fe	1
5380 258		0000	5391 990		0000
5380 516		0 N	5392 212		00 N
5380 909		00 N d?	5392 528	Ni	00
5381 221	Fe	2	5393 375 s	Fe	5
5381 362		0000	5393 584		000
5381 514	Co	0000	5394 404		0000
5381 686		0000	5394 551		000
5381 980	Co	000	5394 839	Mn <sup>*</sup>	{ 1
5382 232		0000	5394 913		{ 1
5382 469		0	5395 209		0000 N
5382 951		0000	5395 422		0
5383 209		000	5395 668		000
5383 325		0000	5396 196		0000 N
5383 578 s	Fe	6	5396 448		00
5383 963		0000	5396 778	Ni	000 N
5384 267		0000	5396 935		000
5384 398		0000	5397 107		000
5384 833		000	5397 344 s	Fe	7 d?
5385 071		0000	5397 822	Fe	1
5385 329		000	5397 993		0000
5385 501		0000	5398 256		0000
5385 785		00	5398 486	Fe	3
5386 089		000	5399 065		000
5386 301		0000	5399 675	Mn	1 N d?
5386 534	Fe	1	5399 974		0000
5386 797		0000 N	5400 462		0000 N
5386 989		0000	5400 624		0000

\*Compound lines measured as double in solar spectrum

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5400 711	Fe	3	5413 302	A <sup>2</sup> *	00 N
5400 831	Cl	0 N	5413 616		0000 N
5401 472		0	5413 889	Mn <sup>†</sup>	00 N
5401 904		000 N d?	5414 117		0000
5402 151		0000	5414 279		00
5402 273	V	00	5414 547	A?	0000 N
5402 799		0000	5415 083		0000 N
5402 982	Y	0	5415 416 s	Fe V	5
5403 670		0000	5416 282		0000
5404 028	Fe	2	5416 587		0000
5404 357	Fe	5	5417 247	Fe	0
5404 750		00	5418 357		000 N
5404 883		00	5418 463		0000
5405 047		0000	5418 979	Li?	1
5405 192	Cr	00	5419 136	A?	0000
5405 341		000	5419 313	A?	0000
5405 554		1	5419 421	A?	0000
5405 695		0000	5419 627		0000
5405 989 s	Fe	6	5420 113		000
5406 388		0000 N	5420 295		0000 Nd?
5406 543		00	5420 510	Mn <sup>†</sup>	{ 0 N
5406 687		0000	5420 613		{ 0 N
5406 808		0000	5420 821	A?	0000 N
5406 980		1	5421 134		00
5407 243		0000 N	5421 381		0 N
5407 375		0000 N	5421 614		000
5407 587	Mn <sup>†</sup>	{ 0	5421 783		0000 N
5407 688		0	5422 049		00
5407 820		00	5422 370		00
5408 028		0000 N	5422 719		0000
5408 285		0000 N	5422 866		0000
5408 407		0000 N	5423 160		0000
5408 569		0000 N	5423 689		000 N
5408 792		0000 N	5423 802		0000
5409 024		000	5423 963		000
5409 131		0000	5424 170		000 N
5409 339	Fe	2	5424 290 s	Fe	6
5409 632		0000 d?	5424 406		0000 N
5409 823	Li	000	5424 761		000
5410 000 s	Cr	4	5424 860	Ni	1
5410 259		0000 N	5425 464		1
5410 633		0000 N	5425 832		000
5411 124	Fe	4	5426 474		00
5411 428	Ni	1	5427 036		000 N
5411 596		000	5427 431		0000
5411 764		0000	5428 018		000
5412 211		000	5428 534		000
5412 391		0000	5428 918		000
5412 779		000	5429 057		000
5412 997	Mn	00	5429 186		0000

\* Compound lines in both Mn and Sun

\* A means "atmospheric line"

# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS IX

By HENRY A. ROWLAND

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5429 349		00	5438 507		000
5429 495		0000	5438 674		0000
5429 637		000	5438 917		0000
5429 717		1	5439 256		0000
5429 911	Fe	6 d?	5439 506		0000
5430 062		0	5439 676		0000
5430 295		0000 N	5439 914	A	000
5430 572		00	5440 130		000
5430 993		0000	5440 707		0000
5431 266		0000	5440 861		000
5431 590		0000	5441 031		0000
5431 747	A?	000	5441 188		000
5432 061		0000	5441 350		000
5432 564		000	5441 549	Fe?	1
5432 753	Mn <sup>2</sup>	1 N d?	5442 155		0000
5432 951		0000	5442 499	A?	0000
5433 160	Fe	2	5442 628	Cr	00
5433 406		000 N d?	5442 971		0000 N
5433 614		00 N	5443 179		000
5433 844		00 N	5443 405		0000
5434 384		0000 N	5443 629		000
5434 740 s	Fe	5	5443 825		000
5435 069		0000	5444 108		0000
5435 246		000	5444 300		0000
5435 388		00	5444 796	Co	00
5435 790		0000	5444 933		0000
5435 906		0000	5445 080		0000
5436 071	Ni	2	5445 259	Fe	4
5436 265		0000	5445 621		0000
5436 341		0000	5445 710		0000
5436 508	Fe	1	5446 436		0000
5436 650		0000	5446 577		0000
5436 802	Fe	1	5446 797	Ti	2
5436 938		000	5447 130 s	Fe	6 d?
5437 300	Ni?	000	5447 454		0000
5437 413		00	5447 737		000
5437 591		0000	5447 889		0000
5437 766		0000	5448 142		0000
5437 996		0000	5448 304	A?	0000
5438 259		000	5448 582		00

<sup>1</sup>Compound lines in both Mn and Sun

<sup>2</sup>A means "atmospheric line"



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5448 882		0000	5462 988		0000
5449 138		000	5463 174 s	Fe	3
5449 369		000	5463 318		0000
5449 913		0000	5463 494 s	Fe	3
5451 005	Si	00	5463 686		0000
5451 132		0000	5463 841		0000
5451 330		000	5464 037		0000
5452 160		0000	5464 179	Cr	000
5452 309		00	5464 314		0000 N
5452 504		000	5464 490	Fe	0
5452 817		0000	5464 678		0000 N
5453 056		00 N	5465 351	A?	000 N
5453 293		0000	5465 584		0000
5453 444		00	5466 237		0000 N
5453 860		000	5466 409		0000
5454 064		000	5466 609 s	Fe	3
5454 199		00	5466 793		0000
5454 326		000	5466 970		0000
5454 569		0000	5467 198	Fe	1
5454 783	Co	00	5467 355		0000
5454 998		0000	5467 482		0000
5455 297		0000	5467 605		000
5455 671 s	Fe?	2	5467 773		0000
5455 834 s	Fe	4	5467 989		000
5456 117		0000 N	5468 149		0000
5456 319		0000 N	5468 320		00
5456 571	A?	000	5468 601		000 Nd?
5456 734		000 N	5468 843		000
5457 088		0000	5469 000		0000
5457 311		000	5469 278		0000
5457 453		0000	5469 485		00 N
5457 640	Mn	{ 000	5469 972		0000
5457 701		{ 000	5470 298		00
5458 034		0000 N	5470 432	A?	0000
5459 072		0000	5470 650		000
5459 406	A?	000	5470 802	Mn	{ 0
5459 593		0000	5470 883		{ 0
5460 266		0000 N	5471 055		0000
5460 572		000	5471 414	Ti	000
5460 721		00	5471 601		0000
5460 904		0000 N d?	5472 128		0000 N
5461 088		00	5472 503		000
5461 349		0000 N	5472 685		0000 Nd?
5461 602		0000 N	5472 916	Fe	1
5461 762		0	5473 135		0000
5462 027		000 N	5473 211		0000
5462 269	A?	0000 N	5473 373		00
5462 478		0000	5473 594		000
5462 705 s	Ni	1	5473 758		000 N
5462 866		0000	5473 950		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5474 113	Fe	3	5484 517		0000
5474 299		0000	5484 846		000
5474 436	Ti?	00	5485 023		0000
5474 668		000	5485 266		0000
5474 962		0000 N	5485 580		0000
5475 286		0000 N	5485 757		000
5475 645		000 N	5485 915		0000
5475 938		0000 N	5486 016		000
5476 217		0000 N	5486 320		000
5476 387		00	5486 730		000
5476 500	Fe	1	5486 968		000
5476 778	Fe	3	5487 170		000 N
5476 946		0000	5487 354	Fe	1
5477 123 s	Ni	5	5487 534	V	0000 N
5477 290		0000	5487 724	Li	00 N
5477 486		0000	5487 959 s	Fe	3
5477 707		000 N d	5488 139		000
5477 901	Ti	00	5488 374		00 Nd?
5477 992		000	5488 547		0000
5478 160		0000	5488 717		0000
5478 360	A?	0000	5489 194		00
5478 578		00	5489 893		000
5478 668	Fe	0	5490 074		00
5478 900		0000	5490 207		0000
5478 991		000	5490 367	Li	0
5479 234		0000	5490 531		0000
5479 451		0000 N	5490 672		0000
5479 983		0000	5490 905		0
5480 185		000	5491 037		000
5480 408		0000	5491 897		0000
5480 562		0000	5492 049		00
5480 722	Cr	00 N	5492 242		0000
5480 964		000	5492 424		000
5481 071	Fe	1	5492 566		000
5481 273		000 N	5493 095		00
5481 452	Fe	1	5493 274		0000
5481 652	Fe, Li	1	5493 450		00
5481 815		0000	5493 558		0000
5481 941		0000	5493 709	Fe	1
5482 078		00	5493 865		0000
5482 200		0000	5494 063		0 d
5482 469		000 N	5494 193		0000
5482 807		000 N	5494 358		0000
5483 131		0000	5494 536		0000
5483 307	Fe	1	5494 679	Fe	0
5483 566	Co	1 d?	5494 912		000
5483 758		0000	5495 096	Ni	00
5483 884		000	5495 916		000
5484 112		000	5496 119		0000
5484 244		000	5496 458		0000

Wave length	Substance	Intensity and Character	Wave-length	Substance	Intensity and Character
5496 780	Fe	00	5507 196	Y Ni	0000
5497 011		000 •	5507 985		000
5497 192		0000	5508 289		0000 d?
5497 325		000	5508 451		0000
5497 447		0000	5508 625		0
5497 624		0000	5508 840		0
5497 735 s		5	5509 058		0000
5497 911		0000	5509 321		0000
5498 105		000	5509 756		00
5498 394		0000	5509 938		000 N
5498 566		0000	5510 120	Fe	0
5498 955		0000	5510 229		1
5499 234		000	5510 449		0000
5499 376		0000 •	5510 586		0000
5499 635		000	5510 829		00
5499 804		00	5510 942		00
5499 976		0000	5511 173		0000
5500 560		0000	5511 375		0000
5500 811		0000	5511 644		000
5500 957		0000	5511 872		0000
5501 193	La	000	5512 013 •	Fe	00
5501 461		0000 N d?	5512 266		00
5501 683 s	Fe	5	5512 470	Fe	1
5501 919	Fe	0000	5512 620		00
5502 088		0000	5512 741	Ti	2
5502 297		00	5512 923		0000
5502 480		0000	5513 025	Ca	0000
5502 783		0000	5513 198 s		4
5502 955		0000	5513 439	Ti	0000
5503 153		00	5513 592		0000
5503 286		1	5513 769		0000
5503 444		00	5513 926		0000
5503 710		00 N	5514 057		0000
5503 927		000 N	5514 189		0000
5504 117	Ti	0	5514 431		0000
5504 310		00	5514 563	Ti	2
5504 431	Mn	0000	5514 753		2
5504 599		00	5514 902	Mn	0000
5504 867		0000	5515 006		000
5505 099		0000	5515 150		0000
5505 489		0000	5515 317		0000
5505 747		0000 N	5515 565		000
5505 939		0000	5515 697		0000
5506 095		1	5515 857		00
5506 243 •		0000	5516 051		0000
5506 395		000	5516 253		0000 N
5506 576		000	5516 513		000
5506 719	Fe	000	5516 708		000
5506 823		0000	5516 950		0
5507 000 s		5	5517 034		0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5517 286	Fe	0	5527 796	Mg	000 d
5517 458		0000	5528 084		0000 N
5517 589		0000	5528 297		000
5517 756		00	5528 641 s		8
5517 984		0000 N	5529 115		00
5518 307		000	5529 384		00
5518 378		0000	5529 564		000
5518 576		0000	5530 001		0000
5518 754		0000	5530 178		000 d
5519 001		0000	5530 491		0000
5519 289		0000	5530 704		00 N
5519 633		000	5530 997		00 N
5519 797		0	5531 321		0000
5520 069		000 N	5531 913		0000
5520 246		0000	5532 202		00
5520 434		000 N	5532 353		000
5520 727		00 N	5532 571		000 N
5520 920		0000	5532 968		1
5521 160	Fe	00 N	5533 092		0
5521 349		00	5533 248		000
5521 511		00	5533 365		0000
5521 646		000	5533 651		000
5521 799		00	5533 791		000
5522 002		0000 N	5534 011		000 d
5522 407		0000 N	5534 504		000
5522 665		2	5534 620		0000
5522 883		0000 N	5534 895		000
5523 176		0000 N	5535 061 s	Fe	2
5523 469		000	5535 277		0000 N
5523 550	Ti	000	5535 399		000 N
5523 783		000 N	5535 644		2
5523 960	Fe	0000	5535 778		0
5524 077		0000	5535 985		0000
5524 209		00	5536 072		0000
5524 482		000	5536 300		000
5524 684		000	5536 492		000
5524 785		0000	5536 679		0000
5525 010		000	5536 811		00
5525 220		000	5537 031		0000
5525 347		00	5537 139		0000
5525 565		0000 N	5537 332		000
5525 765		2	5537 509		0000
5525 929		000	5537 726		0000 Nd?
5526 066		000 N	5537 928	Mn	00
5526 405		000 N	5538 025		00
5526 789		000 N	5538 253	Fe	0000
5527 033		3	5538 405		0000
5527 208		000	5538 526		0000
5527 325		0000	5538 738		1
5527 619		0000	5538 925		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5539 273	Fe	0000	5551 995	Mn	0000 N
5539 507		0	5552 193		000
5539 745		0000 Nd?	5552 452		000
5540 044		000	5552 673		0000Nd?
5540 192		0000	5552 916		00
5540 393		000 N	5553 068		0000
5540 661		000 N	5553 346		000 N
5540 940		000	5553 452		000 N
5541 110		000	5553 619		0000 N
5541 501		0000	5553 804	Fe	1
5541 805		0000	5553 927		0
5542 361		0000	5554 161		0000
5542 545		0000	5554 459		0000 N
5542 756		0000	5554 748	Fe	0000
5542 969		0000	5554 879		0000
5543 112		0000	5555 036		00
5543 262		000	5555 122 s		3
5543 414 s	Fe	2	5555 395		0000
5543 626		0000	5555 572		0000
5543 975		0000	5555 683		0000
5544 157 s	Fe	2	5555 860		000
5544 386		000	5555 951		0000
5544 560	Y	0000	5556 418		0000 N
5544 831		000	5556 691		0000
5544 983		0000	5556 933		0000 N
5545 266	Fe, V	0000	5557 196	Fe	000
5545 487		0000	5557 287		000
5545 643		0000	5557 710		000
5545 913		0000 Nd?	5557 946		000 N
5546 147		000 } d	5558 136		0
5546 248		000 }	5558 209		0
5546 562		0000	5558 391		0000
5546 732		2	5558 472		0000
5546 956		000	5558 816		0000
5547 215		1	5559 068		000 Nd?
5547 522		0000 Nd?	5559 281		000 Nd?
5547 910		0000 N	5559 867	Fe	00
5548 161		0000	5560 106		000
5548 413		0000	5560 243		0000
5548 535		0000	5560 434		2
5548 697		0000	5560 647		0000
5549 546		0000	5560 911		0000
5549 748		0000	5561 234		0000
5549 875		00	5561 464		00
5550 179		00	5561 699		0000 N
5550 873		0000	5561 821		0000 N
5551 110		0000	5562 044		0000 N
5551 241		0000	5562 343		000
5551 524		0000 N	5562 500		0000
5551 767		000 N	5562 717		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5562 933	Fe	2	5575 310		0000
5563 144		0000 N	5575 614		0000
5563 506		000 N	5575 766		0000
5563 623		0000	5575 897		0000
5563 824	Fe	3	5576 079		0000
5563 916		0	5576 320 s	Fe	4
5564 352		0000 N	5576 589		0000
5565 191		0000	5577 252		00
5565 700	Ti	00	5577 561		000
5565 931	Fe	3	5577 783		0000
5566 172		0000 N	5578 739		0000
5566 304		00	5578 946	Ni	1
5566 456		0000	5579 260		0000
5566 629		0000	5579 381		0000
5566 780		0000	5579 574		000
5566 947		000	5579 711		0000
5567 035		000	5580 530		0000
5567 205		0000 N	5580 672		000
5567 367		0000 N	5580 879		0000
5567 501		000	5581 273		0000
5567 621	Fe	2	5581 502		0000
5567 802		0000	5581 740		0000
5567 989		000 Nd?	5581 922		0000 N
5568 297		000	5582 198 s	Ca	4
5568 490		0000	5582 367		0000
5568 682		0000	5582 506		000
5568 925		0000	5582 630		0000
5569 088		00	5582 973		0000
5569 249		0000	5583 186		000
5569 370		000	5583 358		0000
5569 542		0000	5583 607		0000 N
5569 848 s	Fe	6	5583 845		000 N
5570 286		000	5584 208		00 N
5570 615		000	5584 532		000
5570 827		000	5584 729		000
5570 982		0000	5584 988	Fe	0
5571 708		0000	5585 260		0000
5572 370		000 N	5585 397		000
5572 572		0000 }	5585 543		0000
5572 669		0000 }	5585 726		0000
5572 871		000	5585 877		000
5573 075	Fe	6	5586 222		0000
5573 328		1	5586 497		000
5573 524		0000	5586 900		000 N
5573 762		0000	5586 991	Fe	7
5573 876		000	5587 355		0000
5573 974		000	5587 588		0000 Nd?
5574 616		000	5587 800	Fe	0
5574 834		0000	5587 947		0000
5575 128		000	5588 084	Ni	1

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5588 368		000	5602 995	Fe	1
5588 469		0000	5603 083	Ca	3
5588 985 s	Ca	6	5603 186	Fe	4
5589 227		000	5603 516		0000
5589 429		0000 N	5603 738		0000
5589 582	Ni	0	5603 993		00
5586 794		0000 Nd?	5604 416		0000
5590 079		00	5605 171		000
5590 343 s	Ca	3	5605 560		0000
5590 589		000	5605 864		000
5590 725		0000	5606 122		000
5590 927	Ti	000	5606 268		0000
5591 039	Ti	000	5607 220		000
5591 226		0000	5607 372		0000
5591 586		000	5607 614		000
5592 192		0000	5607 761		0000
5592 375	Ni	0	5607 887		00
5592 487	Fe, Ni	1	5608 059		0000
5592 643		000	5608 393		000
5592 881		000	5608 525		000
5593 458		0000	5608 930		0000 N
5593 680		000	5609 196		00
5593 961	Ni	0	5609 395		0000
5594 196		0000 N	5609 901		0000
5594 383		0000 N	5610 023		000
5594 691 s	Ca	4	5610 205		000
5594 884	Fe	1	5610 467		000
5595 112		0000 N	5610 609		0000
5595 284		000	5611 584		00
5595 704		0000	5611 855		000
5595 906		0000	5612 573		000
5596 129		0000	5612 710		000
5596 402		000	5613 929		000 N
5596 555		0000	5614 253		0000 N
5597 290		000	5614 497		00 N
5597 465		0000	5614 632		0000
5598 524 s	Fe	1	5614 819		0000
5598 711 s	Ca	4	5614 997	Ni	0
5599 034		000	5615 199		0000
5599 170		0000	5615 382		0000
5600 243		00 } d	5615 520 s	Fe	2
5600 318		0000 }	5615 751		0
5600 450	Fe	0	5615 877 s	Fe	6
5600 678		0000	5616 404		000
5601 037		0000	5616 541		0000
5601 505 s	Ca	3	5617 163		0000
5601 654		0000	5617 365		00
5602 042		00 Nd?	5617 451		00
5602 296		000	5617 633		0000
5602 783		000	5617 765		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5617 972	Fe	0000	5630 091	Fe	0000
5618 130		000	5630 313		000
5618 292		0000 N	5630 516		0000
5618 646		000 N	5631 194		0000 N
5618 858		1	5631 376		0000
5619 060		000 N	5631 720		0000
5619 192		0000 N	5631 913		000 N
5619 455		000	5632 049		000 N
5619 637		0000	5632 232		000
5619 824		0	5632 672		000 Nd?
5620 037		000	5632 971		0000
5620 250		000	5633 441		000 Nd?
5620 452		0000 Nd?	5633 659		0000 N
5620 634		000	5633 866		0000
5620 715		0	5633 967		0000
5620 862	Fe	0000	5634 171 s		3
5621 438		000 N	5634 446	C	0000 Nd?
5621 595		000 N	5634 740		0000
5621 833		000	5635 412		0000
5622 450	Fe	000	5635 559	C	0000
5622 996		000	5635 736		0000
5623 179		00	5636 045		1
5623 857		0000	5636 218		0000
5624 245 s		1	5636 339	Fe	0000
5624 408		0000 N	5636 455		000
5624 575		0000 N	5636 688		000 N
5624 769 s		4	5636 925		0
5625 096	Fe, V	000	5637 113	Fe?	0000 Nd?
5625 304		0000 Nd?	5637 339		1
5625 541		0	5637 632		1
5625 755		000	5637 928	Fe	000 N
5625 904	Ni	00	5638 488		3
5627 245		000 N	5638 707		0000
5626 468		0000	5638 980		00
5626 812		0000	5639 575		000
5627 034		000	5639 775	Fe	0000
5627 313		000	5640 215		0000
5627 475		0000	5640 397		0000
5627 592		0000	5640 538		0
5627 723	V	000	5640 721	Fe	0000
5627 859		00	5640 903		0000
5628 087		0000	5641 206		1
5628 239		000 N	5641 353		000
5628 411		0000	5641 510	Fe	0000
5628 571		00	5641 667 s		2
5628 867		00	5641 954		0000 d
5629 099		0000	5642 112	Ni	0
5629 261	Cr	000	5642 396		0000
5629 453		0000	5642 605		00
5629 924		0000	5642 846		000



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5642 978		00	5657 471		0000
5643 302	Ni	0	5657 667		000
5643 503		0000 N	5657 890		0000
5643 817		0000 N	5658 097 s	Y,-	2
5644 159		000	5658 378		0000
5644 257	Ti	00	5658 561		0
5644 365		0	5658 753	Fe	1
5644 566		000	5658 884	Cr	0
5645 254		000 N	5659 052	Fe	4
5645 830 s	Si	1	5659 326		0000
5646 039		00	5659 545		0000
5646 322		000 N	5659 817		0
5646 530		0000 N	5660 001		0000
5646 904		00	5660 133		0000
5647 461	Ti	00	5660 365		0000
5647 664		0000	5660 527		0000
5647 765		0000	5660 739		00
5647 997		0000	5660 892		0
5648 119		0000	5661 022		0
5648 503		000	5661 240		000
5648 796	Ti	00	5661 418		0000
5648 969		0000	5661 570	Fe?	0
5649 131		0000	5661 712		0000
5649 304		00	5661 833		0000
5649 611	Cr	00 N	5662 025		0000
5649 898	Fe-Ni	0 d	5662 200		0000
5650 209	Fe	1	5662 374	Ti	0
5650 420		0000	5662 526		0000
5650 501		0000	5662 744 s	Fe	4
5650 669		0000	5662 967		0000 N
5650 911	Fe	1	5663 155	Ti, Fe, Y	1
5651 099		0000	5663 341		0000
5651 256		0000	5663 735		0000
5651 489		0000	5664 039		0000
5651 691	Fe	0	5664 218	Ni-Cr	1 N
5651 954		0000 N d?	5664 413		0000
5652 239		0000	5664 575		0000
5652 542	Fe	1	5664 797		000
5653 387		0000	5665 557		0000
5653 898		0000	5665 775	Si	1 N
5654 091	Fe	1	5666 131	A?	000
5654 231		0000	5666 899		0
5654 716		00	5666 998		000
5654 991		0000 N	5667 368		0
5655 156		00 N	5667 542		000
5655 395	Fe	1	5667 739	Fe	2
5655 558		0000	5667 997		0000
5655 715 s	Fe	2	5668 300		0000
5655 908		0000	5668 593	V	000
5657 107		0000	5669 130		0000

# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS X

By HENRY A. ROWLAND

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5669 258		I	5680 470		00
5669 464		0000 N d?	5680 769	A?	0000
5669 962		0	5680 978	A	000
5670 163	Ni	0	5681 292		000
5670 304		0000	5681 462		000
5670 569	A	000	5681 747		0000
5671 071	V	0	5681 965	A	00
5671 285		0000 N	5682 031	A?	0000
5671 712		00 N	5682 427		2
5672 047	Sc	0	5682 718		000
5672 485		0000 N	5682 869 s	Na	5
5673 022		0000	5683 230		000 N
5673 272		0000	5683 696	, A?	000
5673 634		000 N	5683 989	A	000
5674 198	A	0000	5684 098	A	0
5674 387		0000	5684 118		0000
5674 496	A	0000	5684 415		1
5674 835		0000 N	5684 710	Si	3
5675 305		0000 N	5684 950		0000 N
5675 647 s	Ti	2 N	5685 250	A?	0000
5675 946		000 N d?	5685 657	-, A	00 d
5676 568		0000	5685 996	A?	000
5677 007	A	000	5686 100		000
5677 175		0000	5686 371		0000
5677 680		0000	5686 429		0
5677 919		00	5686 580		000
5678 277		0000	5686 757	Fe	3
5678 621		000	5687 063		000
5678 830		000	5687 192		0000
5679 025	-, A?	0000 N	5687 697	-, A	0
5679 249 s	Fe	3	5687 834	A?	000
5679 501		0000 N	5688 436 s	Na	6
5679 821	A	0000 N	5688 759		0000
5680 149		000	5688 810	A	00

What is known as the "low sun band" begins at  $\lambda$  5670 and extends nearly to the "rain-band" at  $\lambda$  5860. Its existence is supposed to be due mostly to some dry gas in the Earth's atmosphere. There are, however, probably water-vapor lines scattered through this region, and some of the lines are known to be due to oxygen.

The "rain-band" begins at  $\lambda$  5860 and extends to  $\lambda$  6030.

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5689 255	A?	0000	5702 876	Ti	000
5689 694	Li	0	5703 012	A	0000
5689 812	A?	0	5703 136		000
5690 117	A	000	5703 308		0000
5690 286		0000	5703 438	A	000
5690 447	, A	000	5703 591		0000
5690 646	Si	3	5703 797	V	1
5691 715	Fe	2	5703 915		000
5691 919		00	5704 427	A?	000
5692 641	A	1	5704 608		0000
5692 970	A?	{ 000	5704 729	A?	0000
5693 095		{ 000	5704 960	A	0
5693 330		0000	5705 282	A?	0000 N
5693 547		000 N	5705 525	A?	0000
5693 865	Fe	3	5705 688	Fe	1
5694 379	A?	000	5706 215	Fe	3
5694 962	Cr	0	5706 329		0
5695 207	Ni	2	5706 941		00 N
5695 456	A?	0000	5707 204	V	0
5696 160	A	00	5707 265	Fe	1
5696 320	La	0	5707 462		000
5696 582	A?	000	5707 614		0000
5696 869		0000 N	5707 927		000 N
5697 040	A	00	5708 135		0000 N
5697 614	A?	0000	5708 317	Fe	1
5697 794	A	000	5708 622 s	Si	3 N
5698 047	A?	0000 Nd?	5708 881		0000
5698 242	Fe	0	5709 130		000 N
5698 400	A	0	5709 328		0000
5698 555	Fe, Cr	1	5709 601 s	Fe	5
5698 746	V	1	5709 775 s	Ni	5
5698 910	A	000	5710 005		000
5699 106		0000 N	5710 144		00
5699 530	A	0	5711 016	A	000
5699 638		000	5711 313 s	Mg	6
5699 805	A	0000	5711 615	A	000 d
5700 402		00	5711 760	A	000
5700 508	Cu?	00	5712 098	Fe	3
5700 738		000	5712 357	Fe	2
5700 938	A	0	5712 620		000
5701 131		0000 Nd?	5712 835	, A?	000
5701 323	Si	1 N	5712 996	Cr	0
5701 544		0000	5713 436		0000
5701 772 s	Fe	4	5713 670		000
5701 961		0000	5714 120		000
5702 110	A	000 N	5714 276	A	000
5702 228		0000	5714 380	Fe	0
5702 360		0000	5714 620		0000
5702 543	Cr	0	5714 774		00
5702 754		0000	5714 959		000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5715 116	Ni-Ti, Fe	0000	5727 873		00
5715 308 s		5	5728 096		0000 N
5715 540		0000	5728 319		0000 N
5715 689		000	5728 742	A	00
5716 040		000	5729 096	A-	00 d ?
5716 441		0000 N	5729 417		000
5716 671		00	5729 876	A	0
5717 186		000	5730 030	A	00
5717 523		0000	5730 116	A?	0000
5717 723		00	5731 075		0 N
5717 918	Fe	000	5731 252		000 N
5718 055		4	5731 437		00
5718 338		000 N	5731 535		00
5718 510		000 N	5731 769		000
5719 154		00	5731 084 s	Fe	4
5719 208		0000	5732 214		0000
5719 536		0000	5732 335		0000
5719 795		1	5732 522		0
5719 931		000	5732 790	A	0000
5720 040		00	5732 948		000
5720 275	A?	0000	5733 097		000
5720 568		000	5733 306	A	00 Nd?
5720 666		0	5733 550		0000
5720 933		000	5733 722		0000
5721 115		0	5733 908	A	000
5721 267		0000	5734 106		0000
5721 930		00	5734 262	A?	000
5722 047		000	5734 571		0000 N
5722 170		0	5734 786		0
5722 397		000	5735 790	A	0
5722 721	A?	000 Nd?	5735 923		00
5722 997		0000 N	5736 241		0000 Nd
5723 590		000	5736 858		0000
5723 756		0000	5737 288		0
5723 885		000	5737 530	A?	000
5723 989		000	5737 688		0000
5724 107		0	5737 910	A, Mn	1
5724 313		000	5738 453		0
5724 683		00	5738 693	A?	000
5725 224		0000	5738 767		000
5725 517	, A?	0000	5739 084		0000 N
5725 880		000	5739 275	A?	000
5726 168		000 Nd?	5739 458		0000
5726 519		0000	5739 698		0
5726 701		0000	5739 873		000
5726 918		000	5740 020	A?	000
5727 097		0	5740 195		0
5727 271		2 N	5740 369		0000
5727 505		0000 N	5740 582	A?	0000
5727 682		000 N	5740 825		0000 N

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5741 088	A?	000	5754 308		000
5741 432	A?	000	5754 450	A	0
5741 715	A?	000 N	5754 623	Fe	0
5741 927		0000	5754 881 s	Ni	5
5742 068 s	Fe	2	5755 133		000 N
5742 293		000	5755 370	A	000 N
5742 420	A	0	5755 585	A	000 N
5742 785	A,-	000 N	5755 701	A	000
5743 025		0000	5755 970	A	000
5743 182		0	5756 182	A	000
5743 410		00 Nd?	5756 410	A?	0000
5743 645		00	5757 037	Fe	2
5743 774	-, A?	00	5757 293	A	000
5743 961	A	000	5758 161	A	000
5744 153		00	5758 493	A	000
5744 416		0000	5758 654	A	000
5744 679		0000	5758 978		000
5744 995	A	000	5759 120	A	000
5745 165	A	00	5759 338	A	000
5745 290	A	000	5759 488		0
5745 491	A	000 N	5759 760		0
5745 706	A	000 N	5760 403		0000
5745 932	A	00	5760 572	Fe	1
5745 997	A	1	5760 748		000
5746 638	A,-	000	5760 914	A?	0000
5747 025	A	000 Nd?	5761 052	Ni	2
5747 502	A	000	5761 305		000
5747 890		1	5761 485	-, A?	000
5748 075		000	5761 637		0000
5748 176	Fe	2	5761 800	A	0
5748 380		000 Nd?	5762 062		0000
5748 576	Ni	2	5762 479	Li	000 Nd?
5748 737		0000	5762 635	Fe	1
5748 941		0000	5762 840	A	00 N
5749 110		000	5763 058		0
5749 513		00	5763 218 s	Fe	6
5749 850		000	5763 460	A	000
5750 270	A,-	000 N	5763 625	A,	00
5750 427		0000	5766 080	A?	000
5750 723	A	000	5766 485	-A?	000
5750 852		0000	5766 550	Li	0
5751 357		0000	5766 808		0000
5752 018	A	000 N	5767 358	A	0
5752 254 s	Fe	4	5768 225	A	000 N
5752 459	A?	000 Nd?	5768 575	A	000 N
5753 105	A	000 N	5769 120		000 N
5753 344 s	Fe	5	5769 295	A,-	000
5753 610		000 N	5769 547		0
5753 860	Cr	1 N	5769 692		0000
5754 193	A?	000 N	5769 900	A	0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5770 405	A	00 N	5782 313 } <sub>s</sub>	Cu?	3
5770 714	A-	000 Nd?	5782 390 }		3
5771 008	A	0000	5782 582		000 N
5771 382	A	000	5782 815	Cr	000 N
5771 595	A	000	5783 078		000 N
5771 820		00	5783 288		2
5772 040		0000 Nd?	5783 463		000
5772 364 s	Si	3	5783 697		0000 N
5772 630		000	5783 888	Cl	0000
5772 800	A	000	5784 080 s		3
5772 889		0000	5784 268		000 N
5773 155	A	00	5784 605	Fe	000 N
5773 363	A	00	5784 879		1
5773 718	A-	000 N	5785 036	Cl	000
5773 982		0000 N	5785 188		2
5774 250	Γ <sub>1</sub> , A	0	5785 498	Fe	3
5774 457	A,	00 N	5785 772		00 N
5774 761		0000 N	5785 952	Cr	1
5775 020		0000 N	5786 193		0 N
5775 304 s	Fe	4	5786 373	Ti, Cr	000
5775 521		0000	5786 747		000 Nd?
5775 833		0000	5786 964		0000 N
5775 969	A	0000	5787 235		00
5776 292	A	000	5787 488		000
5776 468	A,	000	5787 941	Cr	000 N
5776 958	A,	000 N	5788 141 s		4
5777 737		000 N	5788 305		A (O)
5777 975		000	5788 398		A (O)
5778 222		0000	5788 504		A (O)
5778 505		0000	5788 611	Cr, A (O)	00
5778 677	Fe	1	5788 755		0
5778 890	A	000 N	5788 865	A?	0000
5779 025	A?	000	5788 990		00
5779 406		0000	5789 095	A (O)	00
5779 583	A	000	5789 210		000
5779 778		0000	5789 418 <sup>*</sup>	A (O)	0 d
5779 913		000	5789 565		0000
5780 176	A	0000	5789 700	A (O)	000
5780 378	A	000	5789 850		0000
5780 520		000	5789 978	A?	0000
5780 600		0	5790 071		0
5780 825	Fe	2	5790 186	A (O)	0000
5781 024	Fe	0	5790 313		0
5781 130	Cr, 1 <sub>1</sub>	00	5790 307	-, A (O)	00
5781 288		0000	5790 581		000
5781 400	Cr	0	5790 759	A (O)	000
5781 573		0000	5790 878		000
5781 763		0000	5790 985	A (O)	00
5781 967	Cr	0	5791 174 } <sub>s</sub>		4
5782 138		000	5791 243 }	Fe	3

<sup>\*</sup> Principal line in the head of the δ group (atmospheric oxygen)

TABLE OF SOLAR SPECTRUM WAVE-LENGTHS 115

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5791 405		000	5803 802		0000 N
5791 485	A (O)	00	5804 045		0000 N
5791 620	A?	0000	5804 254	Fe	1
5791 750	, A	0	5804 479	11	0
5791 974		000	5804 681	Fe	0
5792 140	A (O)	00	5804 996		0000
5792 311	A?	0000	5805 198		0000
5792 405	A?	0000	5805 441 s	Ni	4
5792 829	A?	0000	5805 638		000
5792 984	A (O)	00	5805 840	A (O)	0
5793 005		000	5805 986	1 a	0
5793 085		0000	5806 261	A?	0000 N
5793 292		3	5806 510	A (O)	0
5793 610	A (O)-	000	5806 747		0000
5793 920	A?	000	5806 950 s	Fe	5
5794 137	Fe	2	5807 172	C?	0000
5794 375		0000 N	5807 309	C?	000
5794 562		0000	5807 465	C?	0000
5794 664		000 N	5807 809		0000 N
5794 839		0000 N	5808 015	A,-	0
5795 086		0000	5808 207		00
5795 212		000	5808 406	A?	0000
5795 508		0000	5808 526	A?	0000
5796 102		000	5808 781	A?	0000 N
5796 304 x	Ni, A (O)	0	5809 085	A (O)	00
5796 486		0000	5809 256		0000
5796 635		00	5809 439 s	Fe	4
5796 885		000	5809 670		000 N
5796 985		00	5809 741	A (O)	00
5797 263		0000	5809 830		000 N
5797 497	A?	0000	5810 090		000 N
5797 715	A (O)	00	5811 010		00
5797 815	Ti?	000	5811 823		000 Nd?
5798 077 s		3	5812 139	Fe	0
5798 220	A?	000	5812 345		0000 N
5798 398 s	Fe, A (O)	4	5812 418		0000
5798 728	A,	000	5812 616	A (O),-	00
5799 154	A?	0000	5812 719		0000
5799 382	A?	0000	5812 942		0000
5799 730	A?	0000	5813 060		000
5800 055	A	0000	5813 270	A (O),-	00
5800 185	A (O)	00	5813 553		0000 N
5800 443	A-	000 Nd?	5813 884		000
5800 844	-, A (O)	0	5814 228		00
5801 058	A,	0000	5814 788		0000
5801 483		00 Nd?	5815 030	Fe	1
5801 965	A,	000 N	5815 246		0000 Nd?
5802 546	A?	0000 N	5815 441	Fe	0
5802 885	A (O)	0	5815 663		0000
5803 549	A (O)	0	5815 766		0000

\*First line in the tail of the  $\delta$  group (atmospheric oxygen) mixed with a solar line.

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5815 870		00	5834 440	A (O)?	0000
5816 086		000	5834 756		000
5816 289		0	5835 070	-, A (O)?	0000 N
5816 481	, A (O)	{ 00	5835 325		0
5816 601 s	Fe	{ 5	5835 475		000
5816 845		0000Nd?	5835 645		00
5817 057	A (O), Mn?	00	5835 800		000
5817 299		0	5836 360		0000 N
5817 593		0000	5836 990		000
5817 708		000	5837 425		000
5819 517		0000	5837 925	Fe	0
5819 779		0000 N	5838 225		000
5820 145		00	5838 378		00
5820 510	A (O)	000	5838 592	Fe	1
5821 110	A (O)	000	5838 770	A	000
5822 107		00 N	5838 896		00
5822 680		00 N	5839 154	, A	0000
5823 079		000	5839 600	A	000
5823 388		000	5839 823		00
5823 575		0000	5841 050	A	000
5823 910		00	5841 405		000
5824 388		000	5842 600		000
5824 628		00	5842 756	A	00
5824 858	A (O)	000	5843 110		00
5825 511	A (O)	000	5843 438		00
5825 975		00	5843 869	A?	0000
5826 328		0000	5844 057	A?	0000
5826 545		000	5844 405	A?	000
5826 860		000 N	5844 828		00
5827 299		0000	5845 140		00
5827 597		000 }	5845 509		0
5827 689		00 }	5845 696	A	000
5827 897	A	000	5845 965	A?	0000
5828 097		0	5846 185		00
5828 460	A	000	5846 487		00
5828 979		0000 Nd?	5846 780		0000
5829 533	, A (O)?	0000 N	5847 016		0000
5830 198		0000 }	5847 221	Ni	1
5830 305	A (O)	000 }	5847 477		0000
5830 895		000	5847 775		0000Nd?
5831 468	A (?)	0000	5848 105		0000Nd?
5831 821	Ni	1	5848 342	Fe	1
5831 967		000	5848 662		0000
5832 155		000 N	5848 888	A	000
5832 490		000 N	5849 187		000
5832 691		000	5849 415		000
5833 188		0000	5849 909		0
5833 886		0000 N	5850 145		000
5834 145		000	5850 320		000
5834 251		0	5850 553	A	0000



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5851 025	A	00 N	5865 027	A	000
5851 220	A	000	5865 109		0000
5851 427		0	5865 633	A (wv)	000
5852 005		0000 N	5865 852	A (wv)	00
5852 223		0000 N	5866 068	A (wv)	000 }
5852 443	Fe	3	5866 172	A (wv)	000 }
5852 789		000 N	5866 363	A (wv)	000 }
5853 378		0	5866 483		000 }
5853 538		000	5866 675	I <sub>1</sub>	3
5853 690		000 N	5866 857		0000
5853 902 s	Ba <sup>2</sup>	5	5866 959		0000
5854 168	A	0000	5867 221		0000
5854 327	A <sup>2</sup>	0000	5867 302		00 N
5854 535		000	5867 550		000 N
5854 811	A <sub>2</sub>	000	5867 785	Ca	2
5855 060	A	000	5868 010		0000
5855 300	Fe	1	5868 132		0000
5855 476		0000	5868 362		0000
5855 567	A <sup>2</sup>	0000	5868 507		0000
5855 755		0000 Nd?	5868 988	A	00 N
5856 105		0000	5869 320		0000
5856 312	Fe	2	5869 566	A	0000
5856 645		0000 N	5869 888	A	000
5856 838		0000	5870 008	A (wv)	00
5857 674 s	Ca	8	5870 864	A (wv)	1
5857 976	Ni	3	5871 103		0000
5858 205		000 N	5871 305	A (wv)	000
5858 495		00	5871 523	A (wv), -	0
5858 750		000 N	5872 000	A	000
5859 001		0	5872 247	A	000
5859 215	, A	000 N	5872 427	A	000
5859 463		000	5872 490	A <sup>2</sup>	0000 N
5859 620		0000	5873 343		0000
5859 809 s	Fe	5	5873 436		1
5860 176		0000	5873 630		0000
5860 306	A <sup>2</sup>	0000	5873 790	A (wv)	0
5861 331		0	5873 988		00 N
5861 845	A (wv) <sup>2</sup>	0	5874 175	A (wv)	0000
5862 021	A	000	5874 697	A <sup>2</sup>	0000
5862 582 s	Fe	6	5874 865	A (wv)	000
5862 817		0000	5874 995		0000 N
5863 075		000 N	5875 360	A (wv)	00 N
5863 380	A	000	5875 660	, A <sup>2</sup>	0000
5863 685	A	000	5875 815	A (wv)	0
5863 933		0000	5875 985	-, A (wv)	0000 N
5864 167		000	5876 338	A (wv)	1
5864 268		0000	5876 514		00
5864 463		0	5876 664	A (wv)	0
5864 575	A	000	5876 770		0000
5864 742		0000	5877 027		0000

<sup>2</sup> A (wv) stands for an atmospheric line due to water-vapor

Wave-length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5877 273	A	000	5885 973	A?	0000
5877 547	A (wv)	00	5886 193	A (wv)	5
5877 640		0000 Nd?	5886 390		0000
5877 780	A (wv)	000	5886 560	A (wv)	1
5877 903		0000	5886 620	A (wv)	0
5878 015		0	5886 905	A (wv)	0
5878 245		000 N	5887 045	A	000
5878 504	A	0000	5887 445	A (wv)	5
5878 790		0000 N	5887 690		000
5879 225	A	0000 N	5887 880	A (wv)	3
5879 417	A (wv)	00	5888 056	A (wv)	00
5879 506		0000	5888 404		0000
5879 715		00	5888 655		0000
5879 820	A (wv)	1	5888 920	A (wv)	2
5879 945	A (wv)	1	5889 110		0000
5880 035		0000	5889 303	A (wv)	00
5880 250		0 N	5889 587		0000 N
5880 490		00	5889 855	A (wv)	3
5880 649		0000	5890 100 <sup>2</sup>	A (wv)	2
5880 725	A (wv)	00	5890 186 D <sub>2</sub> <sup>1,2</sup>	Na	30
5880 832		0000	5890 425	A (wv)	0
5880 948	A (wv)	0	5890 529		000
5881 147	A (wv)	1	5890 720		00 Nd?
5881 320	A (wv)	0	5890 950	A (wv)	00 Nd?
5881 500		0	5891 125	A?	0000 Nd?
5881 636	A	000	5891 398	A (wv),-	1
5881 760		0000	5891 581		0000
5881 940		000	5891 720	A (wv)	0
5882 084	A (wv)	1	5891 878	A (wv)	4
5882 203	A (wv)	0	5892 108		000
5882 412	A	0000 N	5892 271	A?	0000
5882 589	A	000	5892 493	A?	0000
5882 708	A	000	5892 608	A (wv)	3
5883 025	A (wv)	0	5892 690		000
5883 218	A (wv)	00	5892 920	Fe	00
5883 285		000	5893 097 <sup>s</sup>	Ni	4 d?
5883 529		0000	5893 268	A (wv)	0
5883 589	A?	000 N	5893 455		000
5883 655		0000 N	5893 725	A (wv)	1
5883 790		0000 N	5894 050	A?	0000
5884 028 } <sup>s</sup>	Fe	4	5894 360	A?	0000
5884 120 }	A (wv)	5	5894 605	A (wv)	0
5884 245		0000	5894 820	A (wv)	0000 N
5884 410	A (wv)	0	5895 162	A (wv)	0
5884 655		000	5895 360	A (wv)	0
5884 960	A	000	5895 582		0000
5885 278		00	5895 901		00 N
5885 596		000	5896 155	Na	20
5885 733	A (wv)	000	5896 357 D <sub>1</sub> <sup>s3</sup>		00 N
5885 840	A (wv)	00	5896 506		000

<sup>1</sup> This line is coincident with the edge of D<sub>2</sub> toward the violet and is therefore very difficult to see

<sup>2</sup> The width of D<sub>2</sub> is 0 175

<sup>3</sup> The width of D<sub>1</sub> is 0 160

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5896 635	A (wv)	0	5905 148		0000
5896 710	A (wv)	1	5905 335	A (wv)	00
5896 857		0000	5905 505	A (wv)	0
5897 047	A (wv)	2	5905 583	A (wv)	00
5897 300	A (wv)	00	5905 652		0000
5897 400		0000	5905 745	A?	0000
5897 470		00	5905 895 s	Fe	4
5897 677	A (wv)	0	5906 130	A?	0000Nd?
5897 750		000	5906 390	A (wv)	000
5897 970	A (wv)	00	5906 505	A (wv)	000
5898 160	A (wv)	00	5906 733		000
5898 378 } s	A (wv)	4	5906 864		0000
5898 430 } s		00	5907 060		0
5898 615	A (wv)	000	5907 220	A (wv)	00
5898 745		0000	5907 475	A (wv)	0
5898 980	A (wv)	00	5907 574	A (wv)	000
5899 011	A?	0000	5907 692	A (wv)	00
5899 215	A (wv)	2	5907 873		0000
5899 315		0000	5908 070	A (wv),-	1
5899 518	T <sub>1</sub>	1	5908 258	A?	0000
5899 752	A (wv)	00	5908 425	A (wv)	1
5899 887		000	5908 640	A?	0000
5900 135	A (wv)	2	5908 795	A?	0000
5900 260	A (wv)	4	5908 945		0000
5900 585	A?	0000	5909 020		0000
5900 648	A (wv)	000	5909 213	A (wv)	3
5900 981	A?	0000	5909 395		0000
5901 140	A (wv)	00	5909 668	A (wv)	00
5901 296	A?	0000	5909 878	A?	0000
5901 465	A (wv)	00	5910 060	A?	0000
5901 682 } s	A (wv)	6	5910 197	Fe	1
5901 745 } s		00	5910 398	A (wv)	1
5901 926		0000	5910 528	A (wv)	000
5902 028		0000	5910 700	A (wv)	00
5902 238	A (wv)	000 N	5910 855	A (wv)	00
5902 363	A (wv)	1	5910 987	A (wv)	2
5902 465		000	5911 140	A (wv)	000
5902 694	Fe	0	5911 365		0000
5902 870	A?	0000	5911 435	A (wv)	000
5903 035	A (wv)	000	5911 710	A (wv)	000
5903 334		0000	5911 810	A?	0000
5903 555		00	5912 093	A (wv)	00
5903 748	A (wv)	1	5912 228	A (wv)	00
5903 918	A (wv)	00	5912 345		000
5904 070	A (wv)	00	5912 757	A (wv)	000
5904 160	A (wv)	00	5912 918	A (wv)	0
5904 420	A?	0000	5913 212	A (wv)	3
5904 592	A (wv)	000	5913 358	A?	0000
5904 850	A?	0000	5913 570		0000
5905 050	A?	000	5913 930	A?	000

# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS XI

By HENRY A. ROWLAND

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5914 118		0000	5922 578	A (wv)	0
5914 335 } s	Fe	4	5922 735	A (wv)	2
5914 430 } s	-, A (wv)	6	5922 930	A (wv)	0
5914 700	A?	0000	5923 235		0000
5914 850		0000	5923 405	A (wv)	00
5915 146	A (wv)	I	5923 500		0000
5915 380		0000	5923 702		0000
5915 650	A (wv)	I	5923 865	A (wv)	I
5915 840	A (wv)	I	5924 040	A (wv)	2
5916 050	A (wv)	000	5924 180		000
5916 240	A (wv)	00	5924 490	A (wv)	4
5916 475 s	Fe	3	5924 787		0000
5916 675		0000	5924 975	A (wv)	000
5916 800	A (wv)	0	5925 082		{ 0000
5916 984	A (wv),-	000	5925 220	A (wv)	{ 2
5917 093	A?	000	5925 460		0000
5917 365	-, A?	0000 N	5925 799	A?	0000
5917 605	A (wv)	0	5926 048		0000
5917 827		0000	5926 244		0000
5918 022		0000	5926 418		0000
5918 225	A (wv)	00 d	5926 835	A (wv)	000
5918 420	A?	0000	5927 040	A?, -	0000
5918 635	A (wv)	4	5927 425		0000
5918 773	T <sub>1</sub>	0	5927 750		0000
5918 980		0000 N	5928 013	Fe	2
5919 175	A (wv)	000	5928 280		000
5919 276	A (wv)	5	5928 510	A (wv)	2
5919 505		0000	5928 740		0000
5919 585	A?	0000	5928 890	A?	0000
5919 860 s	A (wv)	7	5929 056	A (wv)	000
5920 060	A?	0000	5929 100		000
5920 395	A (wv)	00	5929 350	A (wv)	00
5920 546	A?	0000	5929 630	A (wv)	000
5920 776	A (wv)	I	5929 898	Fe	2
5920 981	A?	0000	5930 145	A?	0000
5921 374	A (wv)	00	5930 225		0000
5921 558	A?	0000 N	5930 406 s	Fe	6
5921 878	A (wv)	0	5930 640		0000
5922 100	A?	0000	5930 815	A (wv)	00
5922 334	T <sub>1</sub>	0	5930 980		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5931 230	A (wv)	00	5942 635	A (wv)	I
5932 118		0000	5942 789	A (wv)	3
5932 306	A (wv)	5	5942 950		0000
5932 456	A?	0000	5943 120		0000
5932 699	A?	0000	5943 330		0000
5932 998	A (wv)	2	5943 605		000
5933 233	A (wv)	0000	5943 815		00
5933 425		0000	5944 065		0000
5933 670	A?	0000	5944 230		0000
5933 872	A (wv)	000	5944 530	A (wv)	I
5934 024		000	5944 713		0000
5934 140	A (wv)	000	5944 945	A (wv)	I
5934 300	A (wv)	00	5945 230		0000
5934 490		0000	5945 463	A (wv)	00
5934 655		0000	5945 530	A (wv)	00
5934 881 s	Fe	5	5945 865	A (wv)	I
5935 165		0000	5946 104	A?	0000
5935 400	A (wv)	00	5946 223	A (wv)	3
5935 625		000	5946 485	A?	0000
5935 863	A?	0000	5946 685		000
5936 038	A (wv)	0	5946 864	A (wv)	000
5936 278		0000	5947 062	A (wv)	I
5936 428	A?	0000 N	5947 283	A (wv)	2
5937 183		0000	5947 500		0000
5937 345	A (wv)	0000	5947 644	A (wv)	000
5937 523	A (wv)	000	5947 730		00
5937 670	A (wv)	000	5947 955	A?	0000
5938 035		000	5948 195	A?	0000
5938 160	A (wv)	000	5948 452	A (wv)	00
5938 270	A (wv)	0	5948 765 s	Si	6
5938 500	A (wv)	000	5948 995	A (wv)	000
5938 810	A (wv)	00	5949 240	A (wv)	0000
5938 965		0000	5949 390	A (wv)	2
5939 455		0000 N	5949 566	Fe	I
5939 633		0000	5949 794	A (wv)	000
5939 967		0000	5949 880	A (wv),-	000
5940 185	A (wv)	0	5950 040	A (wv)	0
5940 400	A?	000	5950 229		0000
5940 640	A (wv)	I	5950 356	A (wv),-	00
5940 875		0000 N	5950 560	A (wv)	0
5941 091	A (wv)	00	5950 688		0000
5941 210		0	5951 070	A?	0000
5941 290	A (wv)	5	5951 181	A (wv)	00
5941 470	A (wv)	000	5951 310		0000
5941 630	A?	0000	5951 440	A (wv)	000
5941 845	A (wv)	2	5951 530	A (wv)	000
5941 985	T <sub>1</sub>	00	5951 718	A (wv)	0
5942 220	A?	0000	5952 015		0000
5942 399		0000	5952 406		0000
5942 500	A (wv)	000	5952 578	A?	000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5952 740		000	5965 163	A (wv)	00
5952 943	Fe	4	5965 370	A?	0000
5953 207		0000 N	5965 543	A?	0000
5953 386	T <sub>1</sub>	1	5965 740		0000
5953 583	A?	0000	5966 055	T <sub>1</sub> , A?	2
5953 680	A (wv)	00	5966 223		0000
5953 935		0000	5966 430	A (wv)	000
5954 200	A?	000	5966 560	A (wv)	0
5954 595	A (wv)	000	5966 706	A?	0000
5954 906		0000	5966 885	A (wv)	1
5955 170	A (wv)	1	5967 218	A?	000
5955 331		0000	5967 540	A (wv)	00
5955 570		0000	5967 720		0000
5955 890		0000	5967 880		000
5956 039	A (wv)	000	5968 058	A (wv)	2
5956 252	A (wv)	000	5968 280	A (wv)	000
5956 364	A (wv)	0000	5968 495	A (wv)	2
5956 573	A (wv)	0	5968 630		0000
5956 715		0000	5968 882	A?	0000
5956 923 s	Fe	4	5969 260	A (wv)	0
5957 175		0000	5969 510	A?	0000
5957 253		0000	5969 795		000
5957 365	A?	0000	5970 046	A?	0000
5957 790		0000	5970 280	A (wv)	0
5958 098	A (wv)	1	5970 480	A?	000
5958 297		0000	5970 714		0000
5958 460	A (wv),-	1	5970 908	A (wv)	000
5958 565		00	5971 182		0000
5958 840		1	5971 366		0000
5959 025	A?	0000	5971 557	A (wv)	1
5959 380		000	5971 990		0000
5959 535	A?	0000	5972 970		0000
5959 830		000	5973 203		0000
5959 940		000	5973 578		0000
5960 200	A?	0	5973 695		0000
5960 560		0000	5974 094	N	0000
5960 800		0000	5974 495		0
5961 444		0000	5974 812	N	0000
5961 665	A (wv)	0	5975 054		0000
5961 955		0000	5975 330	A (wv)	1
5962 110		0000	5975 413		0000
5962 390	A?	000	5975 575 s	Fe	3
5962 516	A?	0000	5975 820		0000
5962 690	A (wv)	0	5976 046		0000
5962 840		0000	5976 150	A?	000
5963 134		0000	5976 387		0000
5963 326		0000	5976 504		0000
5963 406	A?	000	5976 694	A (wv)	00
5963 790		0000	5976 730	,A?	0
5964 826		0000	5977 007 s	Fe	4

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5977 252 s	A (wv)	1 d?	5989 313	A?	0000
5977 513		0000	5989 510	A (wv)	0
5977 655	A (wv)	00 N	5989 788		0000
5978 033	A (wv)	0	5990 290		000
5978 292		0000	5990 595		0000
5978 365	A?	000	5990 830	A (wv)	00
5978 560		0000	5991 070	A (wv)	0
5978 768	T <sub>1</sub>	1	5991 237		0000 N
5979 012		0000	5991 600		2
5979 135		000 N	5991 790		0000
5979 455	A?	0000 N	5992 010		000
5979 527		0000	5992 218	A (wv)	0
5979 915		0000 N d?	5992 409		0000
5980 395	A (wv),	00	5992 555		0000
5980 740	A (wv)	000	5992 900		0000
5980 965	A?	0000	5993 275	A (wv)	00
5981 043		0000	5993 674		0000
5981 450	A?	00	5993 875		0000
5981 614		0000	5994 135	A (wv)	00
5981 930	A?	0000	5994 563		0000
5982 085		000	5994 756	A (wv)	0
5982 200		0000	5995 491	A?	0000 N
5982 530		000	5995 916		0000
5982 838		0000 N	5996 164		000 N
5983 098	A (wv)	00	5996 247		0000
5983 525	A (wv)	000	5996 445		0000
5983 650		0000	5996 725		0000
5983 908	Fe	5	5996 963	N <sub>1</sub>	1
5984 195	A?	000	5997 195		0000
5984 285		0000	5997 438		0000
5984 495		000	5997 578	A (wv)	0
5984 660		0000	5997 826	A, N <sub>1</sub>	0
5984 810		0000	5998 002	Fe	2
5985 040 s	Fe	6	5998 442		000
5985 435	A (wv)	0	5998 760		0000
5985 615	A?	0000	5999 115		0000
5985 731	A?	0000	5999 204		000
5985 924	A?	0000 N	5999 436	A (wv)	00
5986 350		000	5999 647		0000 N
5986 674		0000	5999 920	T <sub>1</sub> , A (wv)	0
5986 975		0000 N	6000 269		0000
5987 290 s	Fe	5	6000 370	A (wv)	00
5987 525		0000	6000 900	A?	00
5987 774		0000	6001 345	A?	000
5988 048	A?	0000 N d?	6001 765	A (wv)	000
5988 325	A (wv)	000	6002 375	A (wv)	000
5988 574	A?	0000	6002 870	A (wv)	00
5988 785	A (wv)	0	6002 970		0000 N
5988 985		000	6003 239 s	Fe	6
5989 180		0000	6003 538		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6004 095	A (wv)	000 N	6020 232 } s	Fe	2
6004 603		0000 N	6020 401 }		4
6004 895	A (wv)	00	6020 610		0000
6005 098	A?	0000	6020 873		0000
6005 228		0000	6022 016 s	Mn	6
6005 586		0000	6022 440		0000
6005 770	Fe	I	6022 690		0000
6006 003		0000	6023 239		0000
6006 280	A?	000 N	6024 171		0000
6006 605	A?	00	6024 281 s	Fe	7
6007 080		0000	6024 459		0000
6007 255		0000	6025 425		0000
6007 540	Ni	I	6025 000	A?	00
6007 760		0000	6026 380	A?	0000
6007 935		000	6026 615	A?	0000
6008 186 s	Fe	4	6026 900	A?	0000
6008 450		0000	6027 040		0000
6008 556		0000	6027 274 s	Fe	4
6008 785 s	Fe	6	6027 485		0000
6009 031		0000	6027 650		0000
6009 580	A (wv)	000	6027 948	A,	000 N
6010 066	A?	0000	6028 220	A	000
6011 001		0000 N	6028 490	A?	000 Nd?
6011 745		0000	6028 720		0000
6011 980		0000	6029 100		0000
6012 210		0000 N	6029 500		0000 N
6012 450	Ni	I	6030 110	A (wv),	0
6012 660		000	6030 550		0000
6012 996		000 N	6030 860		0000 N
6013 416		000 N	6031 240		00 N
6013 715 s	Mn	6	6031 520		0000 N
6014 130		0000 N	6031 932		0000
6014 641		0000	6032 176		0000
6015 058		0000 N d?	6032 374		0000
6015 258		0000	6032 885		0000 N
6015 475		000	6033 530		0000
6015 830	A?	0000	6033 810		0000 N
6016 070	A?	000	6034 265	A?	0
6016 233		0000	6034 440		0000
6016 624		0000	6034 715		0000 N
6016 861 s	Mn	6	6035 137		0000 N
6017 140		0000	6035 575	A?	0
6017 080		0000	6036 121		0000 N
6018 524		0	6036 434		0000
6018 760		0000	6036 685	A?	0
6019 039	A?	0000	6037 009		0000
6019 372	A (wv)	000	6037 687		0000
6019 596	Ba?	000	6039 540		0000
6019 795		0000 N	6039 693		0000
6020 000		0000 N	6039 808		0000



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6039 953	V	0	6063 316		0000
6040 190		0000	6063 522		0000 N
6042 198		0000	6064 258		000 N
6042 315 s	$\frac{1}{2}$ Fe	3	6064 853	Ti	00
6042 480		0000	6065 709 s	Fe	7
6042 942		0000	6066 020		0000
6043 164		0000	6067 492		0000
6043 640		000	6067 850		000
6043 843		0000	6068 172		0000
6044 258		0000 N	6068 704		0000
6045 705		000	6069 931		0000
6045 985		0000	6070 303		0000
6046 245		0 N	6071 575		0000
6047 280	A?	0000 N	6071 970		0000
6047 880		0000	6072 238		0000
6048 495	A?	0000 N	6073 410		0000
6049 011	A?	0000 N	6073 772		0000
6049 337		000 N	6074 230		0000
6051 245		0000 N	6075 739		0000
6052 061		0000 N	6076 360		000 Nd?
6052 828		000	6076 820		0000 N
6052 906		00	6077 120		00
6053 153		0000 N	6077 480		0000 N
6053 233		0000 N	6077 702		0000 N
6053 476		0000 N	6078 060		000 N
6053 690		000	6078 410		0000 N
6053 912	Ni	0	6078 710 s	Fe	5
6054 125		0000	6078 978		000 N
6054 290	A?	00	6079 227 s	$\frac{1}{2}$ Fe	2
6055 310		000	6080 230		000
6055 620		000	6080 450		0000
6055 980		0000 N	6080 794		0000 N
6056 227 s	Fe	5	6081 422		0000 N
6056 565		000	6081 665	V	0
6056 987		0000 N	6081 930		0000
6057 110		0000	6082 050		0000
6057 475		00 N	6082 640	Co	000 Nd?
6058 080		0000	6082 930	Fe	1
6058 385		000 N d?	6083 915		0000 N
6058 874		0000	6084 325		0
6059 484		0000	6085 470	Ti, Fe	2
6059 970		0000	6085 656		0000
6060 340		0000	6086 128		0000
6060 853		0000	6086 500	Ni	1
6061 037		0000	6086 885		0000 N
6061 870		000	6088 047		00 N
6062 455		0000 N	6088 490		0000 N
6062 704		0000	6089 275		0000 N
6062 910		000	6089 538		0000
6063 080		0	6089 787	Fe	1

# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS XII

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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6090 010		0000	6105 995		000
6090 186		0000	6106 651		0000
6090 287		0000	6106 840		00
6090 429	Fe	2	6107 070		0000
6090 722		0000 N	6107 309		0000
6091 395		0	6107 560		0000
6091 580		0000	6108 108		0000
6091 714		0000	6108 334 s	Ni	6
6091 945		000	6108 503		0000
6092 133		1	6108 675		0000 d?
6092 737		0000	6109 105		0000
6093 030		000	6109 545		0000
6093 366		00 N	6110 042		0000
6093 580	A?	0000	6110 555		0000 d?
6093 864	Fe	2	6111 005		0000
6094 075		0000	6111 290 s	Ni	2
6094 590	Fe	1	6111 545		0000 N
6095 118		0000	6111 872	V	0 d?
6095 575		0000	6112 235		0000
6096 360		0000 N	6112 500		0000 N
6096 880	Fe	3	6112 621		0000
6097 095		0000	6113 142		0
6097 312		0000	6113 340		0000
6097 505		000	6113 538		0
6098 000		0000	6114 075		0000
6098 465		0	6114 600		0000 N
6098 870		00	6115 010		0000
6099 888		0000 N	6115 960		000 N
6100 490		00	6116 268		0000
6102 392 s	Fe	6	6116 397 } s	Ni	4
6102 635		0000 Nd?	6116 455 }	Fe	1
6102 937 s	Ca	9	6116 665		0000
6103 289		0000	6116 900		0000 Nd?
6103 400 } s	Fe	4	6117 210		00
6103 514 }		1	6117 415		000
6103 690		000	6117 623		0000
6103 796		0000	6117 846		0000
6104 830		0000	6118 028		0000
6105 349		0	6118 139		0000
6105 730		0000	6118 320		000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6119 385	V N <sub>1</sub>	0000	6136 829 s	Fe	8
6119 527		0000	6137 210	Fe	3
6119 740		I	6137 428		0000
6119 970		0	6137 505		000
6120 245		0000	6137 710		000
6120 460		00	6137 915	Fe	7
6120 751		0000	6138 266		0000 N
6121 010		0000	6138 725		00 N
6121 215		000	6139 864		000 N
6121 541		0000	6141 020	-	0000
6121 986	Ca	0000	6141 265		000
6122 434 s		10	6141 595		0000
6122 830		000	6141 938 s	Fe, Ba	7
6123 468		0000	6142 225		0000
6123 730		0000	6142 420		0000
6124 287		0000	6142 700		1
6124 703		0000	6143 044		0000 N
6125 236		I	6143 390		0000 N
6125 522		0000	6143 976		0000 N
6126 075		0000 N	6144 550		0000
6126 435	Ti	I	6144 988		0000
6126 665		0000	6145 228		2
6127 001		0000	6145 616		000 N
6127 684		0000 N	6146 445		000
6127 851		0000	6146 882		0000
6128 124	Fe	3	6147 380		0000 N
6128 320		0000	6147 702		0000
6129 190		I	6147 950		2
6129 430		000	6148 040	Fe	3
6129 740		000 N	6148 300		0000 N
6129 940		000	6148 480		0000
6130 145		0000	6148 870		000
6130 344		I	6149 209		0000
6130 560		0000	6149 458	h Fe	2
6131 181		0000 N	6149 766		0000
6131 490	N <sub>1</sub>	0000 N	6149 950		0000 N
6131 785		0	6150 360	V	0 N d?
6132 070		0	6150 840		0000
6132 490		0000 N	6151 052		0000
6132 704		0000	6151 550		0000
6133 020		0000 N	6151 834	Fe	4
6133 440		000 N	6152 054		0000
6133 785		0000 N	6152 226		0000
6134 175		00	6152 520		000 N
6134 810		000 N d?	6152 854		0000
6135 280	V Cr	0000 N	6153 055		0000
6135 580		00 N	6153 560		0000 N
6135 985		00 N	6154 129		0000 N
6136 280		0000	6154 438 s	Na	2
6136 500		0000	6154 650		0000

Wave-length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6154 898		0000 N	6173 276		0000 N
6155 101		0000	6173 553 s	Fe	5
6155 350		7	6173 782		0000
6155 450		000	6174 065		0000
6155 699		0000	6174 948		0000 N
6155 918		000	6175 370		0000
6156 240		00	6175 584	Ni	3
6156 490		000 N	6175 807		0000 N
6157 010		000 N	6176 011		0000
6157 450		0000 N	6176 426		0000
6157 630		000	6176 669		0000
6157 945	Fe	5	6176 815		0000
6158 130		0000	6177 027 s	Ni-	5
6158 380		000 N	6177 255		0000
6158 888		0000	6177 463		0
6159 300		0000	6177 747		0000
6159 590		0	6177 977		0000
6159 910		0000 N	6178 730		0000 N
6160 437		0000	6179 610		000
6160 660		0000	6180 279		0000
6160 956 s	Na	3	6180 420 s	Fe	5
6161 176		0000	6180 587		0000
6161 298		0000	6182 849		0000
6161 503	Ca	4	6183 334		0000
6161 844		0000 N	6183 779	, A (wv)?	0 Nd?
6162 390 s	Ca	15	6184 080		000
6163 630	Ni	2	6185 918	Fe	1
6163 765	Fe	1	6186 424	, A (wv)?	00 N
6163 968	Ca	3	6186 928	Ni	2
6164 777		0000 N	6187 618		00
6165 378		0000	6188 210	Fe	4
6165 577	Fe	3	6188 679		0000 Nd?
6165 760		0000	6189 200	Co, A (wv)?	00 Nd?
6166 105		0000	6189 594		0000 N
6166 266		0000	6190 611		000
6166 410		0000	6190 873		0000
6166 651	Ca	5	6191 048		0000
6168 083		0000 N	6191 393 s	Ni	6
6169 002		0000	6191 779 s	Fe	9
6169 249 s	Ca	6	6194 440		0000
6169 529		0000	6194 633		0 N
6169 778 s	Ca	7	6195 080		0000
6170 178		000 N	6195 663		0 N
6170 420	V	0000 N	6196 373		0000
6170 730	Fe-Ni	6	6198 107		0000
6171 028		0000	6198 864		0000
6171 215		0000	6199 398	V	0
6171 443		0000	6199 718		00
6172 161		0000	6199 985		0000
6172 945		0000 N	6200 160		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6200 527 s	Fe	6	6230 551		0000
6200 690		0000	6230 943 s	V Fe	8
6201 176		0000	6231 211		0000
6203 554		0000	6232 856	Fe	3
6204 698		0000	6233 082		0000
6204 825	Ni	1	6233 408		000
6205 360		0000 N	6233 720		0000Nd?
6207 460		000	6236 816		0000 N
6207 916		0000	6237 534 s		3
6208 425		000	6238 598	h Fe	2
6208 783		00	6239 234		0000
6209 100		0000	6239 585		00
6209 962		0000 N	6239 980		0000
6210 895		00 N	6240 165		00
6212 275		00 N	6240 370		0000
6212 479		0000	6240 530		00
6213 644 s	Fe	6	6240 863	Fe	3
6213 840		0000	6241 065		0000
6214 080	V	000	6243 055	V	000
6214 885		000 N	6243 320		1
6215 231		0000	6243 540		0000 N
6215 360	Fe	5	6244 033		2
6215 630	li	000	6244 335		000 N
6215 931		0000	6244 686		2
6216 103		00 N	6245 137		0000 N
6216 567		1	6245 413		0000 N
6216 810		0000	6245 832		1
6217 900		000	6246 100		0000 N
6219 494 s	Fe	6	6246 535 s	Fe	8
6219 730		0000	6247 774	h Fe	2
6220 150		0000	6249 122		000
6220 450		000	6249 409		0000
6220 700		000	6249 710		0000
6221 005	Fe	0	6249 860		000
6221 222		0000	6251 495		0000
6221 552	Fe,	00 Nd?	6252 048	V	00
6221 850		0000	6252 278		0000
6223 652		0000 N	6252 410		0000 Nd
6224 198	Ni?	1	6252 773 s	Fe	7
6224 407		0000	6254 050		00
6224 715	V	000	6254 382 } s		1
6225 380		0000 N	6254 456 } s	Fe	5
6225 700		0000	6255 000		0000 N
6226 527		0000 N	6255 805		0000 N
6226 951	Fe	1	6256 168	Fe	00
6227 770		00	6256 572 s	Ni-Fe	6
6229 437	Fe	1	6257 090		0000 N
6229 852		0000	6257 802		0000 N
6230 050		0000	6258 322	Ti	2
6230 312	Ni	0	6258 570	V	000 N

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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6258 780	Ti	00	6278 012		000
6258 927		3	6278 177	A(wv)	0000
6259 144		0000	6278 303 <sup>a</sup>	A(O)	4 d
6259 448		0000	6278 579	A(wv)	00 N
6259 800		00	6278 760		0000
6259 980	Ti	0000	6278 907		0000
6261 316 s		1	6279 084	A(O)	2
6261 501		0000	6279 308	A(O)	3
6261 760		0000 N	6279 530	A(wv)	00 Nd?
6262 173		0000	6279 754	A(wv)	0000
6262 458	Fe	0000 N	6279 946		0 d
6263 164		0000 N	6280 108	A(O)	2
6265 015		0000	6280 305		0000
6265 348 s		5	6280 460		0000
6265 573		0000	6280 598	A(O)	2
6265 820	, A (wv)	000	6280 833	Fe	3 d
6266 223		0000 N	6281 025		0000
6266 550		000	6281 228	*	0000
6267 042		0000	6281 387	A(O)	1
6267 424		0000 N	6281 575		0000
6267-860	V	000	6281 835		000 N
6268 040		000	6282 004		0000
6268 433		0000	6282 164	A(O)	2
6268 819		0000	6282 350	A?	0000
6269 080		000 N	6282 502		0000
6269 630	Fe	0000	6282 740	A(wv)	000
6270 200		000	6282 808		000
6270 442		3	6282 933	Co A (O)	2
6270 628		0000	6283 035		000
6271 112		0000 N	6284 002	A(O)	1
6271 486	Fe <sup>-</sup>	0	6284 210		0000
6271 703		0000	6284 748	A(O)	0
6271 970		000	6284 993		0000
6272 157		0000	6285 384	V	00 N
6272 623		000	6285 878		0000 N
6272 870	A(wv)	000	6286 031	A(wv)	00
6273 306		0000 N	6286 359		0
6274 170		000 N	6287 009		0000 N
6274 870		00	6287 494		000 N
6275 478		000	6287 953 <sup>a</sup>	A(O)	1
6276 450	A(O)	0000 N	6288 154	A(wv)?	000 N
6276 690		0000	6288 530		000 Nd?
6276.815 <sup>2</sup>		2 d	6288 839		0000
6277 021		1	6288 955		0000
6277 164		A?	6289 384	A(wv)?	000
6277 359	A?	00 N	6289 606	A(O)	1
6277 513		000	6289 790		0000
6277 639		2	6290 106		0000 N
6277 701		1	6290 427	A(O)	2
6277 837		1	6290 750		000 N

<sup>a</sup> First line in the head of the alpha group, due to atmospheric oxygen<sup>2</sup> Principal line in the head of the alpha group<sup>3</sup> First line in the tail of the alpha group

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6291 184	Fe	4	6308 090		000 N
6292 373	A (O)	2	6309 040		000 N
6292 572		0000	6310 101	A (O)	2
6292 825	A (wv)	0000 N	6310 487		00 Nd?
6293 030	V	000	6310 698		0000
6293 170	A (O)	3	6310 848	A (O)	1
6293 370		0000	6311 055		0000
6294 155		00 Nd?	6311 451		00 Nd?
6294 875	A (wv)	0000 N	6311 722	Fe	1
6295 242		0000	6311 936		0000 N
6295 389	A (O)	3	6312 456		00 N
6295 590		0000	6312 980		000
6295 860	A (wv)	0000 N	6314 077		0000 N
6296 022		0000	6314 449	A (O)	0
6296 170	A (O)	3	6314 876	N <sub>1</sub>	4
6296 360		0000	6315 189	A (O)	0
6296 582	V	0000	6315 517	Fe	2
6296 715		0000	6315 631		00
6297 471	A (wv)?	0000	6315 854		0000
6297 517		0000	6316 028	Fe	1
6298 007	Fe	5	6316 245		0000
6298 295		0000	6316 510	A (wv)	0000 N
6298 513		0000	6316 816		0000
6298 666	Co, A (O)	2	6317 440	A (wv)	0000 N
6298 854		0000	6317 670		0000
6299 436	Fe, A (O)	3	6318 239	Fe	6
6299 625	A (wv)	000	6318 524		0000 N
6299 805		0	6318 919		1
6300 535		000	6319 082	A (O)	0
6300 904		000	6319 274		0000
6301 718	Fe	7	6319 460		0
6302 056		0000	6319 690	, (wv)?	000
6302 209	A (O)	2	6319 806	A (O)	0
6302 401		0000	6320 250	A (wv)	0000 N
6302 709	Fe	5	6320 660		000
6302 975	A (O)	2	6321 070		00
6303 159		0000	6321 505	A (wv)	0000
6303 700		000 N	6322 380	N <sub>1</sub>	0
6303 985		000 N	6322 550		0000
6304 545		000 N	6322 907	Fe	4
6305 070		0000 N	6323 244		0000 N
6305 525		000 N	6323 688		0000 N
6305 878		0000	6323 957	A (O)	00
6306 024	A (O)	2	6324 096	A (wv)	0000
6306 201		0000	6324 709	A (O)	00
6306 430		0000	6324 894		0000
6306 619		0000	6325 382		0000
6306 780	A (O)	2	6325 748		0000 N
6306 950		0000	6327 038		0000
6307 763		0000 N	6327 485		0000

# PRELIMINARY TABLE OF SOLAR SPECTRUM WAVE-LENGTHS XIII

By HENRY A ROWLAND

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6327 820	Ni	2	6361 031	Ni	0
6327 997		0000	6361 415		0000 N
6329 142	A (O)	000	6362 560	/n	1
6329 855	A (O)	000	6363 090	Cl, Fe	2
6330 316	Cr	1	6364 575	Fe	1
6331 067	Fe	2	6364 920		0
6331 345		0000	6366 564	Li	000
6331 619		0000	6366 707	Ni	0
6332 180		0 N	6366 982		0000
6333 460	A (wv)	0000	6367 350		000
6334 588	A (O), (wv?)	0000	6367 640		000
6334 903		0000	6369 244		0000
6335 307	A (O)	0000	6369 683	Fe	0
6335 554	Fe	6	6370 574	Ni	00
6336 032	A (wv)?	0000	6371 573	Fe	1 N d?
6336 329	Li	000 N	6375 455		0000
6336 665	A?	0000	6376 033		000
6337 048	Fe	7	6376 385		0000
6339 096	Fe	2	6378 468	Ni	2
6339 335	Ni	2	6378 877		0000
6339 520		0000	6379 165		0000
6340 190		0000	6379 878		0000
6342 603	A (wv)	0000	6380 958	Fe	4
6344 030		0000	6381 359		0000
6344 371	Fe	4	6381 844		0000
6347 310		2 N	6383 932		0 N
6347 572		0000 N	6384 119		0000
6348 080		000	6384 886	Ni	1
6350 709		000	6385 303		0000 N
6350 920	A (wv)	0000	6385 680	Mn?	000 N
6351 510		0000	6385 950		0
6352 728		0000	6388 630		000
6353 160		0000	6389 502		0000
6353 602		0000	6390 715		000
6354 060		0000	6391 472		0000 N
6354 868		0000	6392 751		0
6355 246	Fe	4	6393 820 s	Fe	7
6355 410		00	6394 417		000 N
6358 898	Fe	6	6394 700		0000 N
6359 437		0000	6395 378		00 N d?



TABLE OF SOLAR SPECTRUM WAVE-LENGTHS 133

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6396 038		0000	6428 385		0000
6396 600		0000 N	6428 843		0000
6397 757		0000	6430 130		000
6398 205		000 N	6430 485		0000
6399 129		0000 N	6430 665		0000
6400 100		000	6431 066 s	Fe	5
6400 217 s	Fe	8	6431 466		0000
6400 538 s	Fe	2	6431 890		0000
6401 023		0000 N	6432 240		000 N
6401 296		0000 N	6432 529		0000
6401 714		0000	6432 895	Fe?	1
6402 507		0000 N	6433 110	A	0000
6403 345		000 N	6433 665	Fe?	0 N
6403 910		0000 N	6433 948		0000
6404 392		0000 N	6434 706	A	0000
6405 980		00 N d?	6435 260		0000
6406 590		0000 N	6436 267		0000
6407 350		0000 N	6436 630	Fe?	0
6407 515		0 N	6437 136		0000 N
6408 233 s	Fe	5	6437 930		000 N
6408 587		0000	6438 251		0000 N
6408 910	Si?	000	6438 995		000
6409 497		0000	6439 293 s	Ca *	8
6410 643		0000	6439 786		0000
6411 145		00	6440 326		0000
6411 330		000	6440 865		0000
6411 865 s	Fe	7	6441 158	Mn?	000
6412 445		0000	6441 835		0000
6413 800		0000 N	6442 693		0000 N
6414 147		0000	6443 180		000
6414 813	Ni	0	6443 700		0000 N
6415 199		1 N	6444 430		0000 N
6415 635		0000 N	6444 880		0000
6416 242		0000	6446 345		0000 N
6416 741		0000	6446 620		0000
6417 133	Fe?	1	6448 170		0000 N
6417 427		0000	6449 355		0 N d?
6417 900	Co	00 N	6449 650		0000 N
6418 095		0000	6450 033 s	Ca	6
6419 585		0000	6450 396	Co	0
6419 880		000	6450 552	Co	0
6420 169 s	Fe	4	6450 866		0000
6420 820		0000	6451 785		000 N
6421 022		0000	6452 536		00 N
6421 570 s	Fe	7	6452 900		0000 N
6421 740	Ni	000	6453 815		0000 N
6425 080		00	6454 350	A	0000 N
6425 748		0000	6455 230	Co	0 N
6426 510		000 N	6455 485		0000 N
6426 900		0000 N	6455 820	Ca	2

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6456 070		0000	6474 330	A (wv)	000 N
6456 238		0000	6474 830	A?	0000 N
6456 603	<i>12</i>	3	6475 280	A (wv)	00
6456 872		0000	6475 435	A (wv)	00
6457 080		00 N	6475 846		2
6457 335	A?	0000	6476 046	A (wv)	0
6457 595		000	6476 584		0000
6458 770		0000	6476 795		0000
6459 115	A	000	6477 240		0000
6459 300	A	0000	6477 550	A (wv)	0000 d
6459 904	A	0000	6478 110		000 N
6460 210	A	0000	6479 408	A (wv)	00
6460 440	A	0000	6479 715	A (wv)	000
6461 154	A?	0000	6480 285 s	A (wv)	1
6461 345		0000	6480 475	A (wv)	0000
6462 060	A	0000	6481 220	A (wv)	000 N
6462 260	A	0000	6481 910	A (wv)	0000
6462 784 } s	Ca	5	6482 098		3
6462 965 } s	Fe	3	6482 410		000
6463 188		0000	6482 690		0000
6463 334	A?	0000	6483 027	N <sub>1</sub>	1
6463 475		0000	6483 286	A (wv)	0000
6463 715	A (wv)	000	6483 468	A (wv)	1
6463 965	A?	0000	6483 677	A (wv)	0000
6464 170		0000	6483 975	A (wv)	0000 N
6464 398		0000	6484 170	A (wv)	00 N
6464 650	A (wv)	000	6484 694	A (wv)	0000
6464 897		00	6484 900	A (wv)	000
6465 630	A?	0000	6485 120	A (wv)	0000
6466 002		0000	6485 360		0000 N
6466 490	A	000 N	6485 790	A (wv)	00
6466 960	A	000 N	6486 495		0000 N
6467 212		0000	6487 005	A (wv)	0
6467 823	A	0000 N	6487 515	A?	0000
6468 120	A	000	6487 755	A?	0000
6468 590	A?	0000	6488 250	A (wv)	000 N
6469 050		0000	6489 350	A (wv)	00
6469 408		2	6489 870		0000 N
6469 593	A (wv)	0000	6490 595		0000 N
6469 860	A (wv)	000 N	6490 877	A (wv)	0000
6470 210	A (wv)	000 N	6491 015	A (wv)	1
6470 794		0000 N	6491 465		0000 N
6471 118		0000 N	6491 800		1
6471 522		0000	6491 876	Mn	000
6471 885 s	Ca	5	6493 130	A (wv)	0
6472 360		0000 N	6493 480	A (wv)	000
6472 700	A (wv)	00	6494 004 s	Ca	6
6472 823	A?	0000	6494 273		0000
6473 405	A (wv)	00	6494 530	A?	0000
6473 744		0000 N	6494 725	A (wv)	1

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6495 213 s	Fe	8	6517 925		0000
6495 962		1	6518 245	A (wv)	00
6496 082	A (wv)	2	6518 599 s	Fe?	2
6496 340		0000	6518 973		0 N
6496 688	Fe	2	6519 410	A (wv)	00 N
6497 128	Fe	4	6519 682	A (wv)	1 N
6497 840	A (wv)	00 N d?	6520 350		0000 N
6498 407		0000 N	6520 983		0000 N
6498 654		0000	6522 123	A (wv)	0000
6499 168	Fe	1	6522 430	A (wv)	0000
6499 437		000 N	6523 145		0000 N
6499 880 s	Ca	4	6523 580	A (wv)	0000
6500 122		0000	6523 907	A (wv)	0000
6500 353		0000	6524 080	A (wv)	1
6501 060		0000	6524 968		0000
6501 440		000 N	6526 040	A (wv)	0000
6501 901		0	6526 655		0000
6502 425		0000 N	6526 888		0
6502 747	A	0000	6527 444		1
6503 114	A	0000	6527 825		0000 N
6503 840	A?	0000 N	6528 340		0000 N
6504 415	A (wv),-	0	6528 777		00
6504 700		0000	6529 415		0000 N
6505 053		0000 N	6530 247		0000
6505 710		0000 N	6530 845	A (wv)	00
6506 560		0000 N	6531 311		0000
6507 340		0000 N	6531 667		000
6507 800	A (wv)	0000 N	6532 595 s	A (wv)	1
6508 380		0000	6532 800		0000
6508 826	A (wv)	0	6533 110	Ni?	0
6509 080		00	6533 330		0000
6509 845		000	6533 763		0000 N
6510 410		0000 N	6534 172 s	A (wv)	2
6511 679		0000	6534 470		0000
6512 240	A (wv)	00	6534 875	A (wv)	0000
6512 470	A (wv)	00	6535 210		0000
6513 145	A?	0000	6536 212		0000
6513 300		0000	6536 955	A (wv)	00
6513 847	A	0000 N	6537 480		0000
6514 185	A?	0000	6537 666		0000
6514 530	A (wv)	000 N	6538 170		000 Nd?
6514 956	A (wv),-	2	6538 770	A?	000 Nd?
6515 456		0000	6540 665	A?	000 N
6516 080	A (wv)	000	6541 510	A?	0000
6516 311 s	h 2e	2	6542 550	A (wv)	00
6516 634		0000	6543 280	A?	0000 N
6516 750	A (wv)	1	6544 140	A (wv)	2
6516 855	A (wv)	2	6546 030	A (wv)	000 N
6517 315	A (wv)	0	6546 479 s	Ti-Fe	6
6517 657		0000	6547 945	A (wv)	0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6548 855	A (wv)	1	6583 787	Λ (wv)	0000
6549 290	A?	0000	6583 967		00
6550 515	A?	0000	6584 550	Λ?	0000
6551 940		000	6584 797	Λ?	000
6552 275		0000 N	6585 470	Λ (wv)	0000 N
6552 865 s	A (wv)	1	6585 763	Λ?	000
6554 025	A (wv)	00 Nd?	6585 950		0000
6554 470	I <sub>1</sub>	0	6586 550	N <sub>1</sub>	1
6555 080		0000 N	6586 764	Λ (wv)	000
6555 700		1 N	6586 935	Λ (wv)	0000
6556 087		0000	6587 864		00 N
6556 308	I <sub>1</sub> , A (wv)	1	6588 828	Λ (wv)	0000 N
6556 558		0000	6590 245		0000 N
6557 046	Fe?	0	6591 575	Fe?	00
6557 408	A (wv)	0	6591 833		0000
6558 095	A?	0000	6592 076		0000
6558 392	A (wv)	00 N	6592 372		0000
6558 830	A?	0000 N	6592 770	N <sub>1</sub>	00
6559 193		0000	6593 161 s	Fe	6
6559 815		0	6594 121 s	Fe	4
6560 045		0000	6594 600	Λ (wv)	000
6560 307		0000	6595 590		0000
6560 490		0000	6596 135		000 N
6560 800	A (wv)-	1 Nd?	6597 273		0000 N
6561 135		000	6597 807	Cr	1
6563 045 s C <sup>1</sup>	H	40	6598 552		0000 N
6563 763	A (wv)	000	6598 848	Fe?	0
6564 305	A (wv)	00	6599 131		0000
6564 450	A (wv)	0	6599 353	T <sub>1</sub>	00
6565 083	A?	0000 N	6599 570	Λ (wv)	000
6565 783	A?	000	6599 925		0000
6566 075	A?	0000	6602 370	Λ (wv)	0000 Nd?
6569 040	A (wv)	000 N	6603 601		0000 N
6569 460 s	Fe	5	6604 837		1
6570 103		0000 N	6605 810		000
6570 965		0000 Nd?	6606 160		000 N
6571 436		0000	6607.215		00 N
6572 330 s	A (wv)	1	6607 586		0000 N
6573 030	Ca?	1	6608 280		0
6573 765		0000 N	6609 360 s		3
6574 468 s		1	6609 818		00
6574 707		0000	6609 929		000
6575 085 } s	A (wv)	1	6610 315		0000
6575 270 } s	Fe	2	6610 990		0000
6576 615		000 Nd?	6611 612		0000
6577 131		0000	6612 474		000
6580 470	A (wv),	00 N	6612 790		0000
6581 025	A (wv)	00	6613 675		00 N
6581 452		0	6614 045	N <sub>1</sub>	00 Nd?
6583 505	A?	0000	6617 267		000 Nd?

<sup>1</sup>The width of C is 0.963, and that of the extreme shading is 1.240. C is either faintly double or reversed in the Sun.

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6617 980		000 N	6657 205		000 N
6618 586		0000 N	6657 878		000
6619 825		000 N	6659 164		0000
6621 441		0000 N	6660 105		000
6622 639		0000 N	6660 830		0000
6624 161		0000 N	6661 320	Cr	00
6624 605		0000 N	6661 580		000
6625 077		0000 N	6662 011		0000 N
6625 276		0	6662 819		0000 N
6626 504		0000	6663 487 s		1
6627 797	Fe?	0	6663 701 s	Fe	3
6628 402		000 N	6664 030		0000 N
6629 210		000 N	6664 550		0000 N
6629 628		0000	6665 420		000 N
6629 924		0000	6665 998		0000
6630 270	Cr	000	6666 780		000 N
6631 325		000 N	6667 695		000
6632 011		0000	6667 980	Fe?	00
6632 267		000	6668 640		000 N
6632 710		00 N	6669 041		0000 N
6633 665		0	6669 550		000 N
6633 995 s	Fe	2	6672 915		0000
6634 361		0	6678 235 s	Fe	5
6635 001		0000 N	6678 817		0000
6635 375	Ni	0 N	6679 090		000 N
6635 636		0000	6680 396		000
6635 940		00 N	6680 864		0000
6636 570		0000 N	6685 131		0000
6638 314		0000	6687 750		0000
6639 505		0000 N	6691 067		000 N
6639 955		0	6692 547		000 N
6640 135		00 N	6693 099		000 N
6642 510		0000 N	6695 886		0000 N
6643 457		0000 Nd?	6696 275		1 N
6643 876 s	Ni	5	6696 565		00
6644 102		0000	6697 070		0000
6644 520		000 N	6697 650		000 N
6645 365		000 N	6698 336		0000 N
6646 309		0000	6698 913		0
6647 205		00	6699 380		00
6648 095		0000	6701 163		0000
6648 360		000	6701 621		000
6648 930		0000	6703 820 s		1
6651 371		0000	6704 286		0000 N
6652 600		0000 N	6704 745		000
6653 215		0000	6705 352 s		1
6654 150		00	6705 753		0000
6654 660		0000	6705 942		0000
6655 770		000 N	6707 695		000
6656 620		0000	6708 176		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6709 226		0000 N	6743 826		000 N
6710 182		0000 N	6745 364		00
6710 570		0	6745 798		000 N
6710 789		0000	6746 235		00
6711 529		0000	6747 226		000
6712 094		000 N	6747 812		0000 N
6712 714		000 N	6748 390		000
6713 290		I	6748 686		0000
6713 454		000	6749 029		000
6713 993		I	6749 120		000
6715 635		I	6749 791		0000 N
6716 500		0	6750 033		0000 N
6716 914		000 N	6750 407 s	Fe	3
6717 775		000	6751 690		0000
6717 940 s	Ca	5	6752 965 s	Fe	I
6719 880		000 N	6753 265		000 N
6721 020		0000 N	6753 720		000 N
6722 096 s		2	6754 233		0000
6722 959		0000 N	6755 189		000
6724 935		000 N	6755 855		0
6725 219		0000	6756 818		000 N
6725 615	Fe	0	6757 445		00 Nd?
6725 960		0000	6757 909		0000 N
6726 539		0000	6759 146		000 Nd?
6726 925 s	Fe	2	6761 260		000 Nd?
6728 922		0000	6761 852		0000 Nd?
6729 270		00	6762 405		0000 N
6729 996		000 N	6762 647		000
6730 558		000 N	6763 549		0000 N
6732 320		00	6763 939		0000 N
6732 921		0000	6764 330		000 Nd?
6733 410	Fe	I	6767 602		0000 Nd?
6733 783		0000 Nd?	6768 028 s	Ni	4
6734 524		000 N	6768 248		0000
6735 277		0000	6769 930		000
6735 708		000 N	6771 310		0 d
6736 099		0000 N	6771 789	- Co	0000
6736 798		000	6772 152		0000
6737 619		0000 N	6772 568 s	Ni	2
6738 230		0	6775 047		0000 N
6738 485		00	6776 595		0000 N
6739 080		00 N	6777 653		00
6739 370		0000	6778 022		0000 N
6739 775		0	6781 172		0000 N
6740 244		0000	6782 061		0000 N
6741 268		0000	6782 465		0000 N
6741 880		0 N	6782 748		000 N
6742 535		0000	6783 609		0000 N
6742 816		0000 N	6783 960		0000 N
6743 381	Tl	I	6784 460		00
					000 N

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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6785 306	Fe	000 N	6820 630 s	Fe	2
6786 010		000 N	6820 987	Fe	0000 N
6786 450		0000 N	6822 293		0000 N
6786 706		000 N	6825 108		000 N
6787 100 s		1	6827 529		0000
6787 850		0000 N	6828 215		000 N
6789 400		000 N	6828 445		0000 N
6789 776		0000	6828 850 s		2
6790 206		000	6829 293		0000
6790 569		0000	6829 832		0000
6790 933		000	6831 098		0000
6792 577		0000	6831 730		0000
6793 088		0000 N d?	6832 727		0000
6793 520		00	6833 501		00
6793 875		0 N	6833 845		0000 N
6794 219		0000	6835 622		0000 N
6794 560		000	6836 956		0000 N
6794 870		000	6837 268		0
6795 675		000 Nd?	6838 612		0000 N
6796 045		000 N	6838 980		00
6796 375		0	6839 088		0
6796 737		000 N	6840 086		1
6797 061		0000	6840 698	Fe	0000 N
6797 410		0000	6841 598 s		3
6798 715		00	6841 897		0000 N
6799 136		0000 N	6842 294		0
6800 265		0000	6842 624		0000 Nd?
6800 855	Fe	00 N	6842 945	Fe	1
6801 450		0000 N	6843 420		000 N
6802 097		0000	6843 913 s		3
6804 102		0000	6844 939		0000
6804 258		0	6845 937		0000
6804 545		0	6847 860		000
6805 126		0000	6848 468		0000 N
6805 354		000	6848 823		0 Nd?
6806 000		0000 N	6849 559		000 N
6806 593		0000 N	6850 110		0000 N
6807 103 s	Fe	1	6850 696	Fe	00 N
6807 630		0000 Nd?	6851 309		0000 N
6808 141		0000 N	6851 910		000
6809 017		0000 N	6852 980		000
6809 878		0000 N	6854 109		0000
6810 519 s	Fe	3	6854 590		000
6812 605		000 N	6854 796		0000
6813 865		000 Nd?	6855 105		00
6814 160	Co	0000 N	6855 419 s		3
6815 210		0	6855 700		0000
6817 903		0000	6855 990		0
6819 845		00 Nd?	6856 290		0000
6820 098		000 Nd?	6857 515		0

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6857 773		0000 N	6875 415		0000 N
6858 109		0000 N	6875 830 s	A (O)	13
6858 415		2	6876 255		000 N
6858 661		0000	6876 595		000 N
6858 863		0000	6876 958 s	A (O)	13
6859 227		0000	6877 440		0000Nd?
6859 752		0000	6877 882 s	A (O)	12
6860 007		000	6878 342		0000 N
6860 358		0000	6878 570		0000Nd?
6860 590		000	6878 800		0000 N
6861 044		0000	6879 288 s	A (O)	12
6861 213		000	6879 528		0000
6861 529		0000	6879 784		000
6861 770	11?	000	6880 040		0000
6862 014		0000	6880 172 s	A (O)	6
6862 210		0	6880 455		0000
6862 431		0000 N	6880 807		00
6862 760		1	6881 305		0000 N
6863 119		0000	6881 720		00
6864 048		0000	6881 983 s	Cr	0
6864 585		000	6882 784 s	C <sub>1</sub>	1
6864 775		0000	6883 325 s	C <sub>1</sub>	1
6865 206		0000	6883 635		0000
6865 704		0000	6884 076 s	A (O)	10
6865 906		000	6884 656		0000 N
6866 243		0000	6885 221	A?	0000
6866 604		000 N	6885 598	A?	0000
6867 037		0000 N	6886 000 s	A (O)	11
6867 457 s <sup>*</sup>	A (O)	6d?	6886 446	A?	0000 N
6867 631	A	1	6886 990 s	A (O)	12
6867 800 s	A (O)	5	6887 242		000
6868 092 s	A	0 Nd?	6887 444		000
6868 336 } s	A (O)	6	6887 765	A	000 Nd?
6868 478 } s	A (O)	6	6887 969	A	000
6868 645 } s	A	1	6888 250	A	000
6868 795 } s	A	3	6888 670		0000
6869 142 s	A (O)	7	6888 830		0000
6869 353 s	A (O)	6	6889 192 s	A (O)	13
6869 850	A?	00	6889 490		000
6870 116 } s <sup>2</sup>	A (O)	7 } d	6889 827		0000Nd?
6870 249 } s <sup>2</sup>	A (O)	7 } d	6890 151 s	A (O)	14
6870 853	A?	000 N	6890 460		000
6871 180 s	A (O)	8	6891 000	A	000
6871 532 s	A (O)	10	6891 180	A	000
6872 105	A?	000	6891 617		0000 N
6872 486 s	A (O)	11	6891 843	A	000
6873 080 s	A (O)	12	6891 970	A	0000
6873 630	A?	0000	6892 618 s	A (O)	14
6874 037 s	A (O)	12	6893 099		000
6874 899 s	A (O)	13	6893 560 s	A (O)	15

<sup>\*</sup> First line in the head of the B group, due to atmospheric oxygen  
<sup>1</sup> First line in the tail of the B group  
<sup>2</sup> Principal line in the head of the B group



Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6894 068		0000 N	6913 810		0000
6894 320		0000 N	6913 945		000
6894 660	A	000	6914 158		0000
6895 200	A?	000 N	6914 337 s	A (O)	11
6895 630		000 N	6914 668		0000
6895 737	A?	0000	6914 823 s	N <sub>1</sub>	4
6896 289 s	A (O)	14	6915 075		0000 N
6896 660		0000 N	6915 270		0000 N
6896 882		0000	6915 775	A	000 N
6897 208 s	A (O)	15	6916 136	A	000 N
6897 673		0000 N	6916 325		0000 N
6897 837		0000 N	6916 743	A	0000 N
6898 160	A?	000 N	6916 948 s		2
6898 556		00	6917 235		000 N
6898 766		0000 N	6917 710	A	000 Nd?
6899 130		0000 N	6918 015		0000
6899 710		0000	6918 370 s	A (O)	9
6900 199 s	A (O)	14	6918 655	A?	000
6900 734		000 N	6918 860		0000
6901 117 s	A (O)	15	6919 250 s	A (O)	9
6901 527		0000	6919 556	A	000
6901 810		000 N	6920 430		00
6902 065		0000	6920 650		0000
6902 443		0000	6921 135	A?	0000
6902 901		0000	6921 615	A?	000
6903 120		00	6921 834	A?	0000
6904 362 s	A (O)	14	6922 238	A?	000
6904 785		000	6922 548	A?	0000
6905 083		0000	6922 735	A	000
6905 271 s	A (O)	14	6922 912		0000
6905 540		000	6923 553 s	A (O)	9
6905 915		0000	6924 080	Cr?	0000 N
6906 295	A	000	6924 427 s	A (O)	9
6906 560		000 Nd?	6924 713	A	000 N
6907 282	A	000	6925 134	Cr?	0000 N
6907 920	A	000	6925 543		1
6908 360		0000	6925 752		0000
6908 783 s	A (O)	13	6926 170		0000
6908 251		0000 N	6926 363		0
6909 676 s	A (O)	13	6926 660		0000
6910 270		0000 N	6926 850		000
6910 510	A?	000 N	6927 020	A	00
6910 994		0000	6927 520	A?	000
6911 310	A	000 N	6927 948		0000
6911 790	A-	00 N	6928 500		000
6912 173	A	000 N	6928 796		0000
6912 690		0000 N	6928 977 s	A (O)	4
6913 038	A	000 N	6929 227	A?	0000
6913 284	11?	0000	6929 375	A	000
6913 448 s	A (O)	11	6929 560	A (wv)	00

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6929 840 s	A (O)	4	6943 379		0000
6930 075	A	00	6943 689		0000
6930 185	A	000	6943 904		0000
6930 600		0000 N	6944 060	$\Lambda$ (wv)	3
6930 890		00 N	6944 510		0000
6931 355		0000	6944 861		0000
6931 575	A	00 N	6945 135		0000
6932 012	A	00	6945 477		4
6932 298		0000	6945 745		0000 N
6932 445	A	00	6946 160		000 N
6932 765		0000	6946 638		0000
6933 024		0000	6946 860	A (O)	0
6933 305		0 N	6947 191		0000 N
6933 469		0000	6947 406		0000
6933 715		000	6047 702	$\Lambda$ (O)	0
6933 887		2	6947 782 s	$\Lambda$ (wv)	5
6934 075	A (wv)	2	6947 863	$\Lambda$ wv	00
6934 325		0000	6948 146		0000 N
6934 468		0000	6949 240	A (wv)	1
6934 670 s	A (O)	2	6949 310	A (wv)	1
6934 870		000	6950 188		0000 N
6935 153		0000	6951 010	A (wv)	1
6935 355	A?	000	6951 518		1
6935 530 s	A (O)	2	6951 900	A?	000
6935 704	A?	0000	6952 593	$\Lambda$	000 N
6936 075	A	000 N	6953 337	$\Lambda$ (O)	00 N
6936 290		0000	6953 828 } s	$\Lambda$ (wv)	1
6936 755		000 N	6954 020 } s	$\Lambda$ (wv)	00
6937 122		0000	6954 147	$\Lambda$ (O)	000
6937 420		000 N	6954 718	A ?	0000 N
6937 957	A (wv)	2 N	6955 307		00
6938 195		000	6955 507	A	0000
6938 520	A (wv)	1 N	6955 915	A (wv)	000 N
6938 727		000	6956 660 } s	A (wv)	4
6939 050		000	6956 746 } s	A (wv)	1
6939 460		0000	6957 675	A	000
6939 875	A (wv)	2	6957 985		0000
6940 030		0000	6958 753	A?	0000
6940 270		0000	6959 704 s	A (wv)	3
6940 436	A (wv)	2	6960 105	A (O)	000 N
6940 625	A (O)	1	6960 590		00
6940 861		0000 N	6960 880	A (O)	0000
6941 023		0000	6961 136		0000
6941 260	A (wv)	000 N	6961 515 s	A (wv)	4
6941 475	A (O), A (wv)	1	6962 075		0000 N
6941 979		0000 N	6962 213		0000 N
6942 402	A (wv)	2	6963 100		000 N
6942 630	A (wv)	1	6963 900	A	000 N
6942 746		0000	6964 447		0000
6943 083		000	6964 812	A (wv)	1

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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
6965 320	A	000 N	6992 065	A	000 N
6965 716		00	6992 571		0000
6966 158		000	6993 145	A	00 N
6967 054		0000	6993 776	A (wv)	2
6968 837		0000	6994 360	A (wv)	1
6969 302		0000	6994 635		0000
6970 763	A	00	6994 880	A	00
6971 135	A (wv)	0	6995 260		0000
6971 400		0000	6996 930		0000
6971 772		000	6997 420	A?	0000
6972 205		00	6998 070	A?	0000
6973 132		0000	6998 283	A	00
6973 743	A	0000 N	6998 500		0000 N
6974 600		0000	6998 978	A (wv)	0
6974 996	A?	000 N	6999 223	A (wv)	2
6975 706		0	6999 488	A	0000
6975 976		0000	6999 823	A	0000
6976 535		000 N	7000 155 s		1
6976 783		1	7000 411		0000
6977 198		00	7000 555		0000
6977 715	A (wv)	3	7000 880		00
6978 138		0000	7001 125	A	000
6978 310		0000	7001 475		0000
6978 670 s		1 N	7001 810		00
6979 120		2	7002 385	A	00 N
6979 420	A	000 N	7002 870		0000 N
6979 610		0000	7003 837		1
6980 060		1	7004 240		0000 N
6980 620	A?	0000 N	7004 575	A (wv)	0 N
6981 196		000	7004 995	A (wv)	2
6981 722	A (wv)	1	7005 365	A (wv)	0 N
6981 860	A?	000	7005 608	A	0000
6982 501		000 N	7005 850	A	000
6982 780		0000 N	7006 157 s		1
6983 810		000 N	7006 420	A	000 Nd?
6984 380		0000 N	7006 915	A	000
6984 870		0000	7007 140		0000 N
6985 220	A (wv)	0 N	7007 385	A	0000 N
6985 776		0000	7007 970	A	000 N
6986 080	A	000	7008 225		0
6986 833 s	A (wv)	3 N	7008 515	A	00 N
6988 125	A (wv)	0 N	7008 920	A?	0000
6988 536		0000 N	7009 485	A	000 N
6988 805		0	7010 135	A (wv)	0 N
6989 075		0000	7010 618		000 N
6989 237 s	A (wv)	3	7010 920	A	0000 N
6989 825		000 N	7011 230	A	000 N
6990 230	A?	0000	7011 590 s	A (wv)	2
6990 632	A (wv)	1	7012 130		0000
6991 295	A	000	7012 490	A	0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
7012 880		o N	7037 800	A	I
7013 550		ooo N	7038 061		0000
7014 080		ooo	7038 202		0000
7014 810		0000 N	7038 500 s		I
7015 260		ooo	7039 040		o
7015 560	A	ooo N	7039 560	A	o N
7015 800		0000 N	7040 053 s		I N
7016 176		0000	7040 861		0000
7016 330 s	,A (wi)	I	7042 025		oo N
7016 675 s	-,A (wv)	3	7042 745		0000
7017 020		ooo Nd	7044 265		0000 N
7017 575	,A	oo Nd	7044 777		ooo
7017 935		o	7044 952		oo
7018 250		0000	7045 313		ooo
7019 043	A	ooo	7045 517		0000
7019 620	A	o	7046 056		0000
7020 445	A?	0000	7047 133		oo
7020 900	A	ooo	7047 631		ooo
7021 100	A	ooo	7048 291		0000
7021 790	A	0000	7049 273		0000
7022 302		0000	7050 783	A?	ooo
7022 662		ooo	7051 115		o
7022 810	A	ooo	7052 030	A?	0000 N
7023 230 s		2	7052 665	A?	ooo N
7023 550		0000	7053 070		I
7023 770 s	A (wv)	2	7053 191	A?	o
7023 983		0000 N	7053 755		0000 N
7024 340		o	7054 280		ooo N
7024 660		0000	7054 970	A	oo N
7024 913 } s		I	7056 210		oo N
7025 140 } s	A	o	7056 750		0000
7026 660	A	oo	7057 260	A	o N
7026 890		0000	7057 590		0000
7027 213 s	,A (wv)	o	7057 820		0000
7027 740 s	,A (wv)	2	7058 186		0000
7028 115	A	o	7058 490	A?	ooo
7028 466		0000	7059 825		0000 N
7028 860		0000 N	7060 314		0000
7029 260	A	o	7060 725		I N
7029 390		oo	7061 780	A	oo N
7029 975	A	0000 N	7062 265		0000
7030 295		o	7062 750		0000
7030 657		0000	7063 255		ooo N
7031 215	A	oo N	7063 770	A?	o N
7032 585		I	7064 400		0000
7034 360	A?	0000 N	7064 917	A?	ooo
7034 670	A	0000 N	7065 496		0000
7035 170 s		2 N	7065 920		I
7036 129		0000	7066 495		ooo Nd?
7037 465	A	o	7067 210		oo N

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
7067 742		ooo N	7097 395		ooo N
7068 265		ooo Nd?	7097 940		oooo
7068 685		2	7099 219		oooo N
7068 870		ooo N	7099 812		oooo N
7069 350		oooo N	7100 415		ooo N
7069 820		oooo	7100 960		oooo N
7070 934		oooo	7102 222		oooo N
7072 130		o N	7102 560		ooo N
7072 720		ooo	7103 430		ooo
7073 070		oooo	7105 422		oooo
7073 890		ooo N	7106 434	A?	ooo Nd?
7074 757		oooo N	7107 300		oooo N
7075 188		oooo	7107 740		o
7075 875		oooo	7108 187		oooo N
7077 087		oooo	7108 387		oooo N
7078 109		ooo N	7109 310	A	ooo Nd?
7078 540	A?	oo N	7110 700		oooo N
7079 130		ooo N	7111 180		1
7079 685		oooo	7111 730	A	ooo N
7079 870		ooo N	7112 199	A	oooo
7081 210		ooo	7112 450		o
7082 445		oooo N	7113 010		oooo N
7082 755		oooo N	7113 455	A?	oo N
7083 104		oooo N	7113 700		oooo
7083 680		oo N	7113 870		oooo
7083 993		ooo N	7114 313	A?	oooo
7084 235		ooo N	7114 447	A?	oooo
7084 531		oooo	7114 860		ooo
7084 920		oooo N	7115 444	A?	ooo
7085 265		2 N	7115 591	A?	oooo
7085 810		oooo N	7116 670		oooo N
7086 590		oooo	7117 240		ooo Nd?
7087 008		oo	7117 549		ooo
7087 550		oooo N	7117 948		oooo N
7088 099		oooo N	7118 390	A?	ooo
7088 430	A?	oo N	7118 554	A	1
7090 000		oooo N	7119 254		oooo
7090 660		2	7119 955		ooo N
7091 430		oooo	7120 320		ooo N
7091 640		ooo	7121 965		oooo N
7092 220		ooo N	7122 484		4
7093 120		oooo	7123 000	A?	oooo
7093 395		ooo	7125 269	A?	oooo
7094 009		oooo	7126 414	A?	oooo
7094 305		oooo	7127 087		oooo N
7094 615		oooo	7127 845		o N
7095 295		oooo N	7128 390	A?	ooo N
7095 690		o	7128 810		oooo N
7096 140		ooo	7129 410	A?	oooo N
7096 660		oooo	7130 140		oooo N

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
7131 204		3	7164 725 <sup>*</sup>	, A	2
7131 650		000 N	7165 018		000 N
7132 043	A?	0000	7165 396		0000 N
7133 263		1	7165 845	A,	1 N
7133 660		000 N	7166 355	A	000 N
7134 423	A	00 N	7166 553	A	0000
7136 120		000 N	7166 931		0000
7137 720	A	1 N	7167 305	A	000 Nd?
7138 209	A?	0000 N	7167 645	A	00
7139 215		000	7168 170	,A	4 N
7139 973		0000 N	7168 465	A	0000
7140 568	A	000 N	7168 748	A	0000
7141 360	A	0000	7169 017	A	0000
7141 930		0000 N	7169 355	A?	00
7142 451	A	0000 N	7170 162	A?	0000
7142 800		0	7170 360	A	00
7143 257	A	1	7170 619	A?	0000
7143 660		0000	7170 833	,A	1
7144 229		0000	7171 130	A	0000 N
7145 022	A	0000	7172 250	A	300 N
7145 615		1	7172 970	A,	1
7147 939	A	2 N	7173 200		000 N
7148 435		3 N	7173 675	A,	2
7148 793		0000	7174 040	A	0
7148 995		000 N	7174 440	A	0
7149 574		0000	7174 930		0000 N
7150 100	A?	0000	7175 580	A?	0000Nd?
7150 450	A?	0000 N	7176 225	A,	1
7150 947	A	1	7176 430	A	1
7151 442	A	1	7176 719		0000
7151 765		00	7177 170	A	0
7152 375		0000	7177 390	A	0
7153 627	A?	0000	7177 640	A,	2
7154 030		0000	7177 915	A	2 N
7155 014		0000 N	7178 690	A	00 N
7155 945		0 N	7179 060		0000
7156 700	A	1 N	7179 570	A	000
7157 438		0000	7179 910		0000 N
7158 084	A?	0000	7180 300	A	000
7158 790		000 N	7181 500	A	0
7159 045	A	0 N	7181 790	,A	2
7159 590	A	00 N	7182 045	A	1
7160 602		0000 N	7182 260	A?	00
7161 154		0000 N	7182 658	A	0000
7161 746		0000 N	7183 089	A	0000
7162 352	A	00 N	7184 650	A	3
7162 630		000 N	7184 785		4
7163 012		0000	7185 205		000 N
7163 469		0000	7185 580		0000 N
7164 125	A?	000 N	7185 870		0000 N

<sup>\*</sup>This is the beginning of the "a" group, most of the atmospheric lines are produced by water vapor, but as the identification is somewhat uncertain in many cases, and as some of the lines may be due to other atmospheric gases, they have simply been marked A

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
7186 405	A	4	7209 780	A,-	3
7186 655	A	5	7210 679	A	000 N
7187 280	A	2	7211 473	A	1
7187 645	,A	5 N	7212 308	A	000 N
7188 286		0000 N	7212 740	A	00
7188 875		0000 N	7214 166	A	000
7189 242	A	0000	7215 042	A,-	000 N d
7189 445	A	00	7215 782	A?	000 N
7189 740		0000	7216 482	A	000
7190 159		000	7216 791	A,-	2
7190 427		000	7216 927	A?	0000
7191 755	A,-	6 N	7217 479		0000 N
7192 150	A	2 N	7218 323	A	000 N
7192 745	A	1 N	7218 799		000 Nd
7193 039		0000	7219 337	A	0000 N
7193 475	A	000 N	7219 987		0
7193 835	A	3	7220 306	A	0000 N
7194 040	A	3	7221 088	A	0000 N
7194 655		0000	7221 492		0
7194 871		0000	7221 870	A?	0000
7195 290	,A	2	7222 691		000 N
7195 827		0000	7223 216	A	00 N
7196 070	A	0 N	7223 930 s	A	3
7196 716	A?	0000 N	7224 414		0000
7197 300	A	0	7224 791		000 N
7197 515	A	1	7225 356		0000
7197 698	A	000	7226 522	,A	000 N
7198 145	A	1 N	7227 781 s		3
7198 705	A	2	7228 468	A?	0000
7199 152		0000 N	7229 013	A?	000
7200 095		000	7229 424		0000
7200 378		0000	7232 520 s	A	1
7200 665	A	2	7233 170 s	A,	3
7200 800	A,	4	7234 688	A	0
7201 460	,A	4	7235 011	A	2
7201 728	A	0	7235 658		000 N
7202 485		1 N	7236 142		000 N
7202 843		0000	7236 418	A	1
7202 138		0000	7236 695	A,	00
7203 135	A	2	7238 216	A,	0000 N
7204 577	A,	5	7239 281	A	0000
7204 672		00	7239 765		0000
7205 022		0000	7240 149	A	1
7206 692	,A	6	7240 883	A	3
7207 165		0000	7241 099	A	2
7207 415		00	7243 750	A	1
7207 715		1	7244 004	A	2
7208 079		0000	7245 152		00
7208 511		0000	7245 959	*A	2
7209 427		0000	7246 457		0000

Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
7247 091		0000	7277 469	A	000
7247 494 s	A	1 N	7277 678		2 N
7248 047		0000 N	7278 385	A	0 N
7249 244	A	0 N	7278 762	A?	000
7249 581		0000	7280 042	A	00 N
7250 511	A	1 N	7280 890	A	00 Nd
7250 928		00 N	7281 913		0000 N
7252 032		000 N	7282 600	A	1 N
7252 355	A	0	7283 112		000 N
7252 664	A	2 N	7283 435	A	000
7253 137	A	00	7284 107		0000 N
7253 493	A	1	7285 158		00
7254 002	A	1	7285 576	A	000
7254 576		0000	7286 249		0000 N
7254 940		000	7286 828		0000 N
7255 586		0000	7287 673 s	A	2 N
7256 422		000	7288 073	A	0000 N
7257 392	A	000	7288 416		1
7257 674		00	7289 049		00
7258 226	A	1 N	7289 466		0 Nd?
7258 939		0000 N	7290 087	A	00 N
7259 357		0000 N	7290 686 s	,A?	3 N
7259 895		0000 N	7291 366	A	0 Nd?
7260 462	A	000 Nd?	7291 757	A	00
7261 028	A	0	7292 025		0000 N
7261 310		0000	7292 409	,A	0 N
7261 808	A?	00 N	7293 009	,A	0 N
7262 260	A	1	7293 372	A	000 N
7262 576		0000	7293 655	A	00
7263 277	A	000	7294 166		0000 N
7263 640	A	0000	7294 651	A	00
7264 125		0000	7295 042	A	000
7264 676	A	00	7295 325	A	1
7264 892 s	,A	2	7295 903	A	00 N
7265 431		0000 N	7296 536	A	00
7265 868 s	,A	5	7299 917 } s	A	0 N
7266 441		0000 N	7300 226 } s	A	1 N
7267 101		0000 N	7300 846		000 N
7268 865		0000 N	7301 169		0000
7269 566		0000 N	7301 599		0000
7270 065 } s	A	00 N	7301 801		0000
7270 414 } s	A	000	7302 394	A	00
7273 255 s	A?,-	5 N	7302 906	A	000 N
7273 941		0000 N	7303 162	A	0000
7274 952		0000 N	7303 485		2
7275 675		2 N	7304 078		0000 N
7276 083	A	000 N	7304 468 s	,A	3 N
7276 581	A	00	7305 195	A	0000 N
7276 810		00	7306 878		00
7277 146	A	00	7307 282		0000 N



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Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
7308 253		oo Nd?	7316 223	A	ooo N
7309 047	A	1	7317 112	A	oo N
7309 788	A	2 N	7317 611	A	o N
7310 474	A	oo	7318 405	A	oo
7311 403	-,A	o Nd?	7319 015	-,A?	1
7312 279		oooo	7321 030 s	A	1 Nd
7312 911	A	1	7324 249	A	1
7313 504	A	ooo N	7326 462		o
7314 797	A,-	ooo	7327 750	A	1
7315 416		oooo N	7331 225 s		1 N
7315 834	A	o			



# CORRECTIONS AND ADDITIONS TO PROFESSOR H A ROWLAND'S TABLE OF SOLAR SPECTRUM WAVE-LENGTHS

THE errors in wave-length have been carefully determined for the whole table, but the identification of solar lines with the lines of the elements in the spectrum of the electric arc has, at the present time, been carefully revised only from wave-length 3722 to 4175. Therefore the corrections and additions to the identifications have been given only for the more important lines between these limits. A very few small solar lines have been added to the table.

The changes in wave-length have been few, most of the changes in this table being additions to the identifications.

## FIRST PART

Page <sup>1</sup>	Wave length	Substance	Intensity and Character	Corrections and Additions		
				Wave length	Substance	Intensity and Character
6				2979 410 <sup>4</sup>		o
8	2980 080		o Nd	2980 080 <sup>4</sup>		o Nd
8	2983 764		ooo N	2983 764 <sup>4</sup>		ooo N
8				2985 769 <sup>4</sup>		ooo
8	2988 333		ooo N	2988 333 <sup>4</sup>		ooo N
8	2988 873		ooo	2988 873 <sup>3</sup>		ooo
8				2989 378 <sup>4</sup>		o
9	3003 773 <sup>1</sup>	Ni	2 Nd <sup>2</sup>	3003 773 <sup>2</sup>	-, Ni	2 Nd <sup>2</sup>
9				3010 996 <sup>1</sup>		2 d
14	3077 295 <sup>5</sup>	Fe	3	3077 295 <sup>5</sup>	Fe	3
14	3077 332 <sup>5</sup>		1	3077 332 <sup>5</sup>		1
18	3138 798	Zr	1	3138 789	Zr	1
21	3177 633	Fe <sup>2</sup>	2	3177 653	Fe?	2
23	3195 705 <sup>5</sup>	Ni	2	3195 705 <sup>5</sup>	Y-Ni	2
23	3200 407		2 Nd?	3200 407	Y,	2 Nd?
23	3203 435		1	3203 435	Y	1
24	3216 807		1	3216 807	Y	1
25	3223 378		1	3223 378	Mn	1
26	3242 395		1	3242 395	Y	1

<sup>1</sup> The page numbers refer to the reprint of the Table, which will soon be ready for distribution.

FIRST PART — *Continued*

				Corrections and Additions		
Page	Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
30	3286 784		0	3286 754		0
30	3289 498		4	3289 498	Eb?	4
32	3308 947		5	3308 947	Co, Ti	5
32	3309 065	Co, Ti	0000 N	3309 065		0000 N
32	3312 453	Co	2	3312 453	Ni	2
33	3328 016	Di?	2	3328 016	Y	2
33	See note to	3335 192, 33	35 350, etc	See note to	3335 299, 33	35 350, etc
35	3353 875		4	3353 875	Sc,	4
37	3372 901	Ti-Pd	5	3372 901 } d?	* Ti Pd	10
37	3372 994		5	3372 994 }		
				* This is probably a strong titanium line which was measured as double, but is probably a single line reversed in the Sun		
38	3385 167		0	3385 167	Y	0
40	3407 937	Di?	0	3407 937	Y	0
43	3443 791	Co	5 d?	3443 791	Co, Ti	5 d?
47	3496 224	Co	0	3496 224	Co, Y	0
53	3565 535 s	Fe	20	3565 535 s	Fe	12
54	3572 712	, Sc	6	3572 712	Sc,	6
62	3683 182	Co	3	3683 182 } s	Co	3
62	3683, 229	Fe-v	4	3683 229 }	Fe V	4
62	3683 761		2	3683 761	Fe	2
63	3685 810		0000	3685 800		0000
63	3694 344		3	3694 344	Eb?	3
64	3706 175	Mn	6 d?	3706 175	Ca, Mn	6 d?

## SECOND PART

				Corrections and Additions		
Page	Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
4	3722 174		2	3722 174 <sup>*</sup>	Fe?	2
4	3725 638		3	3725 638	Fe,	3
4	3727 061	Mn	4d?	3727 061	Fe, Ru Mn	4d?
4	3727 965		2	3727 965	Fe	2
4	3728 183		1	3728 183	Ru	2
4	3728 813	Ti-Fe	2	3728 813	Fe-Ti	2
4	3730 534	Fe	3	3730 534	Fe, Ru	3
4	3732 545 s	Ti Fe-Co	6	3732 545 s	Co, Fe	6
5	3737 059 s	Ca Mn	5	3737 059 s	Mn Ca	5

\* See remarks at the beginning of this Table

## SECOND PART—Continued

				Corrections and Additions		
Page	Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
5	3743 508 s	Fe	6	3743 508	Fe-Ti	6
5	3743 626	Ti	2	3743 626		2
5	3745 617	Ti	1	3745 617	Ti	1
5	3745 717 s	Fe	8	3745 717 s	Fe	8
5	3746 058 s	Fe	6	3746 058 s	Fe	6
5	3746 191	Ni	0	3746 191	Ni	0
6	3753 732	Fe Ti	6	3753 732	Fe-Ti	6 d ?
				3758 269		00
6	3758 269		00	3758 375 s	Fe	15
6	3758 375 s	Fe	15			
6	3759 215	Zr	1	3759 215	La, C	1
6	3759 297	La-Fe	2	3759 297	Fe, C	2
7	3767 493		1 N	3767 493	Ru,-	1 N
8	3787 304	Fe C	1	3787 304	C-Fe	1
8	3788 839		2	3788 839	V	2
9	3789 553	Fe	1 N	3789 553	Fe,-	2 N
9	3799 934	V	1	3799 934		1
9	3800 046 s		0	3800 046	V	0
10	3804 151	Fe	3	3804 151 s		3
10	3804 934	Fe Cr C	2	3804 934	Cr C	2
10	3807 681	Fe	6	3807 681	V Fe	6
10	3811 945	Fe	2	3811 945		2
10	3812 033		2	3812 033	Fe	2
11	3814 671	Fe C	4	3814 617	Co Fe C	4
11	3817 523	Co Ti C	0	3817 523	-C	0
11	3824 441		2	3824 441	Fe	2
12	3825 543		2	3825 543	Cr	2
12	3826 555		1	3826 555	Cr	1
12	3827 714		2	3827 714	Fe	2
12	3829 617	Ti C	2	3829 617	Fe, Ti C	2
12	3829 728	Fe-C	0	3829 728	-C	0
12	3829 822	li C	1	3829 822	Mn, Ti C	1
12	3831 002	Fe	2	3831 002	C Fe	2
12	3833 026		3 N	3833 026	-Ni	3 N
12	3834 006	Mn C	3	3834 006	C Mn Rh	3
12	3836 905		1	3836 905	Zr <sup>2</sup> , Ti	1
12	3837 277		2	3837 277	Fe	2
13	3843 854		2	3843 854	Co,-	2
13	3845 606	Co-C	8 d ?	3845 606	C Co	8 d ?
13	3849 501	C ?	1 N	3849 501	C Cr	1 N
13	3849 675		1	3849 675	Cr	1
13	3850 118	Fe	10	3850 118	Fe-Cr	10
14	3852 347	Cr, C	1	3852 347	Cl, C	1
14	3855 450	V	2	3855 450	Cr, V	2
14	3855 547		1	3855 547	C,	1
14	3857 805	C ?	6 d ?	3857 805	Cr-C	6 d ?
14	3858 262		1 N	3858 262	-Ti	1 N
14	3860 767	C-Ni	3 N	3860 767	Ni, C	3 N
15	3866 577	C-	1	3866 577	C-Ti	1

## SECOND PART—Continued

				Corrections and Additions		
Page	Wave length	Substance	Intensity and character	Wave length	Substance	Intensity and character
15	3868 060	C	2	3868 060	Fe, C	2
15	3873 065	C	2	3873 065	Fe C	2
16	3874 651		2	3874 651	, C <sub>1</sub>	2
16	3876 194	Fe	5	3876 194	Fe, V	5
16	3879 331	C	1	3879 331	C <sub>1</sub> , C	1
16	3883 033	C	1	3883 033	C, Ti	1
16	3883 426	C-	2	3883 426	C Fe	2
17	3884 748	Ca	1	3884 748	Co	1
17	3885 364	Fe, Cr	2	3885 364	Cr	2
17	3886 568	V	0	3886 568	La	0
17				3886 704	V	000
17	3886 942	Cr	3	3886 942	Cr, Mo	3
17	3889 374		1Nd?	3889 374	, Ba	1Nd?
17	3890 068		1	3890 068	Nd, Ce	1
17	3890 707		1N	3890 707	Nd,	1N
17	3891 918		0	3891 918	Ba	0
17	3892 069	Fe	4	3892 069	Cr, Fe	4
17	3894 165	Cr	3	3894 165	Fe, Cr, V?	3
18	3900 681	T - Fe Zr	5	3900 681	Ti Fe	5
18	3902 002		3	3902 002	Nd	3
18	3902 114	Fe	1	3902 114		1
18	3903 090	Fe, Cr	10	3903 090	Cr, Fe, Mo	10
18	3903 302		1	3903 302	Cr	1
18	3903 398		2	3903 398	V-Cr?	2
18				3904 310	V	000
18	3905 017		1	3905 017	Mn,	1
18	3905 146		1	3905 146	Mn	1
18	3906 044		3	3906 044	Nd,	3N
18	3907 807		1	3907 807	Fe, Ti?	1
18	3907 910		1	3907 910	Cr, Nd	1
18	3909 976	Fe	5	3909 976	Fe, V	5
18	3910 079	Co-Ca	3Nd?	3910 079	Ba, Co	3Nd?
19	3913 609	Ti-Fe	5d?	3913 609	Ti-	5d?
19	3921 105		0	3921 105	Nd	0
19	3921 188	Cr-Nd	3	3921 188	Cr-	3
19	3921 855	Zr-Mn	4	3921 855	Ce, Mn-Zr	4
19	3923 180		1	3923 180	Pt, Ce	1
20	3925 347 s	Co, Fe?	4	3925 347 s	Co, Fe? V	4
20	3928 357	Cr?	2Nd?	3928 357	, Mn	2Nd?
20	3929 363	Fe-La-Mn	2	3929 363	Fe La Mn Co	2
20	3929 497	Co?	1	3929 497		1
20	3933 523		8N	3933 523		8N
20	3934 108	Co-	8N	3934 108	Co, V-Zr	8N
20	3934 174		0N	3934 508	Ti, Cr?	0N
20	3938 439		2	3938 439	, Cr	2
20				* Mostly shading of K		
21	3941 323		1	3941 323	Cr, V	1
21	3941 637	Cr	3	3941 637	Cr, Nd	3
21	3941 997		1	3941 997	-Mn	1

## SECOND PART — Continued

				Corrections and Additions		
Page	Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
21	3942 157	Mn?	oN	3942 157	V-	oN
21	3943 721		1	3943 721	V,-	1
21	3948 818	Ti	4	3948 818	Ti, V	4
21	3951 219	Cr	1	3951 219	Cr, Nd	1
21	3952 103	Mn	2	3952 103	Mn, V	12
21	3952 342	Na?	0	3952 342	Nd	0
21	3952 754	Fe	4	3952 754	Ce Fe	4
21	3952 894		0	3952 894	Mn, Nd?	0
21	3953 043	Mn	3	3953 043		3
21				* This V line weak in VCl from Troms-dorff		
22	3955 524		00	3955 624		00
22	3956 476	Co, Ti	4	3956 476	Ce, Co Ti	14
22	3958 355	Ti, Zr	5	3958 355	Zr, Ti, Ce	5
22	3959 972		1	3959 972	Ce,-	1
22	3964 663	Fe	3	3964 663	Ce Fe	3
22	3964 897	Fe?	0 Nd?	3964 897		0 Nd?
22	3966 647	Ni, Fe	2	3966 647		2
22	3966 778	Fe	3	3966 778	Fe, Zr	3
22	3968 350		6 N	3968 350	-, Zr	6 N
22	3968 854	Fe?	1 N	3968 854		1 N
22				* Ce and Co a faint side line		
22				* Mostly shading of H		
23	3968 886		6 N	3968 886		6 N
23	3970 419		1	3970 419	Fe?	1
23	3970 540		2	3970 540	Fe	2
23	3970 631		1	3970 631	Ni	1
23	3973 262	Co	1	3973 262		1
23	3973 796	Fe	1	3973 796	Nd, V, Fe	31
23	3974 536	Fe	3	3974 536	Fe, Ni	3
23	3974 637	Ni?	2	3974 637		2
23	3975 506	Co	1	3975 506	Rh Co, V?	1
23	3977 009	Fe	2	3977 009	Nd Fe	2
23	3978 809	Co, Cr	3	3978 809	Co, Cr, Ce	3
23	3979 664	-, Co	4	3979 664	Nd Co	4
23				* Mostly shading of H		
23				* V line weak in VCl		
24	3981 662		00	3981 662	-, Zr?	00
24	3981 762	Zi?	0	3981 762		0
24	3982 630	Ti Mn	2	3982 630	Ti	2
24	3982 742	Y	3	3982 742	Mn Y	3
24	3983 341		2 N	3983 341	-, Cr	2 N
24	3985 385		0	3985 385	Mn	0
24	3985 463	Mn	1	3985 463		1
24	3985 539	Fe	5	3985 539	Fe	3
24	3986 321	Fe	3	3986 321	Fe Nd	3
24	3988 114		0	3988 114	Eb?	20
24	3990 129	Cr-Mn	1	3990 129	Mn Cr	1
24	3991 690	Co	0	3991 690	Co Mn	0

## SECOND PART—Continued

				Additions and Corrections		
Page	Wave lengths	Substance	Intensity and Character	Wave lengths	Substance	Intensity and Character
24	3991 830	Co Cr	2	3991 830	Ci, Co	2
24	3992 538	Fe	1	3992 538	Fe, Ce	1
24	3994 092	Ci	1	3994 092	Ni <sup>2</sup>	1
24	3994 160	Ni	1	3994 160	Cr	1
24				<sup>2</sup> There is a strong metallic line at 3988 140, which is supposed to be due to erbium, but it is probably not coincident with the solar line		
25	4001 315		3	4001 315	Mn,	3
25	4005 202		1	4005 202	Fe	1
25	4005 632		1	4005 632	Fe	1
25	4005 856		3	4005 856	V	<sup>1</sup> 3
25				<sup>1</sup> This V line is weak in VCl from Fromsdorff		
26	4009 694	Fe	1	4009 694		1
26	4010 327	Fe	1	4010 327	Ce Fe	1
26	4012 541	Ti	4	4012 541	Li, Ce	4
26	4017 620	Ni <sup>2</sup>	2	4017 620		2
27	4021 057	Co	3	4021 057	Nd Co	3
27	4021 893	Li	0	4021 893	Nd	0
27	4022 018	Fe	5	4022 018	Li Fe-V	5 d?
27	4023 533	Co	3	4023 533	V, Co	<sup>2</sup> 3
27	4025 286	Ti	3	4025 286	Ti Ce	3
27	4028 497	Ti	4	4028 497	Fe-Ce	4
27	4028 912	Fe Ce	1	4028 912	Fe	1
27	4030 646	Fe Ti	5	4030 646	Nd Fe-Li	5
27	4030 878	Mn	4	4030 878		
27	(4030 918) }	Mn	5	(4030 918) }	Mn	<sup>3</sup> rod?
27	4030 947			4030 947		
27	4031 048		2	4031 048	Fe <sup>2</sup>	2
27	4031 865	Fe La	2	4031 865	La,	2
27	4031 942	Mn	2	4031 942	Fe?, Nd, Mn, V	2
27	4033 224 s	Fe Mn	<sup>1</sup> 7 d?	4033 224 s	Mn	<sup>3</sup> 8 d?
27	4033 337		1	4033 337	Fe?	1
27				<sup>2</sup> V line weak in VCl from Fromsdorff		
27				<sup>3</sup> Apparent duplicity caused by reversal in Sun		
28	4034 644 s	Mn Fe	<sup>1</sup> 6 d?	4034 644 s	Mn	<sup>2</sup> 6 d
28	4036 923		1	4036 923	V,	1
28	4037 837		1	4037 837	Ce,	1
28	4043 839		0	4043 839	Cr	0
28	4043 956	Ci	0	4043 956	Li	0
28	4044 644		1	4044 644	, Zr	1
28	4045 371	Mn	1 N	4045 371	Ce, Mn	1 N
28	4045 748		2	4045 748	, Zr, W <sup>2</sup>	2
28	4047 338	K <sup>2</sup>	00 Nd?	4047 338	K	00 d
28	4047 461	Fe	2	4047 461	Ce-Fe	2
28	4048 224		1 N	4048 224	Cr	1 N



SECOND PART — *Continued*

				Corrections and Additions		
Page	Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
28				<sup>a</sup> Apparent duplicity caused by reversal in Sun		
29	4049 822		1 Nd ?	4049 882	-, C <sub>1</sub>	1 Nd ?
	4052 603	Mn	2	4052 603	Mn, Fe	2
	4052 650	Fe	3	4052 650		3
	4053 981	Fe Ti	3	4053 981	Cr Fe-Ti	3
	4054 962		2	4054 962	Fe	2
	4055 189	Ti Fe	3	4055 189	Ce Ti Fe, Z <sub>1</sub>	3
	4058 372	Co Fe	4	4058 372	Ti, Co Fe	4
29	4061 881	Mn	<sup>1</sup> { 2 Nd	4061 781	Mn	<sup>1</sup> 2 Nd
29	4062 105		2	4062 105		2
30	4064 361	Ti	1	4064 361	Zr Ti	1
30	4067 139	Fe	5	4067 139	Cr Fe	5
30				4068 555	Cr	000
30	4069 761		1	4069 761	V,-	1
30	4071 680	Fe	1	4071 680	Fe, V	1
30	4072 295		00 N	4072 295	, V?	<sup>2</sup> 00 N
30	4073 921 <sup>5</sup>	Fe	4	4073 921	Ce, Fe	4
30	4078 515	Fe	4	4078 515	Zr Fe	4
30				<sup>a</sup> This line is probably variable in the solar spectrum		
31	4080 368	Fe, Nd	3	4080 368	Fe, Nd, C <sub>1</sub>	3
31	4081 415	Fe	1	4081 415		1
31	4083 095	Mn	4	4083 095	V Mn	4
31				4084 300	Cr	000
31	4085 408		1	4085 408	-, Ce	1
31	4086 133		1	4086 133	Fe?	1
31	4091 109		3	4091 109	Ce	3
31	4092 547	Co, Mn	3	4092 547	Co, Mn, V	3
31	4092 821	<sup>1</sup> V, Ca	3 d?	4092 821	<sup>1</sup> V, Ca	3 d?
31				<sup>a</sup> These lines coincide with the heads of bands due to calcium. The bands probably become lines owing to the weak dilution of calcium vapor in the Sun		
32	4096 262	Fe	2	4096 262	Fe, Nd	2
32	4098 689	<sup>1</sup> Ca?	4	4098 689		4
32	4098 746		2	4098 746	<sup>1</sup> -, Co?	2
32				4101 531		000
32	4101 840		3	4101 840	Fe?	3
32				4105 019	Cr	000
32	4107 649 <sup>5</sup>	Ce Fe / 1	5	4107 649 <sup>5</sup>	Ce-Fe	5
32	4109 905	<sup>1</sup> V	2	4109 905	V	<sup>2</sup> 2
32				<sup>a</sup> One of the strongest Vanadium lines		
33	4111 021	Mn	1	4111 021	, Mn	1
33	4111 154	Mn?	1	4111 154		1
33	4116 707	<sup>1</sup> V	0	4116 707	V, Fe?	0
33	4116 859	Nd?	1	4116 859		1
33	4116 974		00	4116 974	Nd?	00

## SECOND PART—Continued

				Corrections and Additions		
Page	Wave length	Substance	Intensity and Character	Wave-length	Substance	Intensity and Character
33	4119 550	Fe	1	4119 550	C <sup>2</sup> Fe V	1
33	4123 384	<sup>2</sup> La	12	4123 384	<sup>2</sup> La	1
33	4123 539	V	0	4123 539	Ci	0
33	4123 664	Mn	1	4123 664	Ce, V Mn	1
34	4126 200	V	000	4126 200		000
34	4126 344	Fe	4	4126 344	V Fe	4
34	4127 957	Fe	4	4127 957	Ce-Fe	4
34	4128 251	V	6 d	4128 251	Ce-V,	6 d
34	4131 271	Mn	1	4131 271	Ce, Mn	1
34	4132 235	Fe	10	4132 235	Fe-Co	10
34	4134 589	V Fe?	3	4134 589	Fe?	3
34	4134 675		1	4134 675	V	1
35	4137 809	Fe, Ce	1	4137 809	Cc	1
35	4140 400	Fe?	0	4140 400		0
35	4140 558		3	4140 558	, Fe?	3
	4141 809	La	0	4141 809	, La	0 N
				4141 910	La	000 0
35	4143 664		2	4143 664	, Mo	2
35	4147 645	Mn	1	4147 645		1
35	4147 677		000	4147 677	Mn	00
35	4149 360	Zr	2	4149 360	C, Zr	2
36	4150 964	Ce	00N	4150 964		00N
36	4151 129	Zr, Ti	1	4151 129	Ce-Zi, Ii	1
36	4152 108	Fe, La	2	4152 108	Fe, I a, Cc	2
36	4152 242	Ce?	1	4152 242		1
36	4154 265		2	4154 265	, Fe?	2
36	4162 623		1N	4162 623	C, -	1N
37	4162 825		1N	4162 825	Ce, C	1N
37	4163 818	li, Cr	4	4163 818	Cr li,	4
37	4165 550	Fe	3d ?	4165 550	C, Fe	3d
37	4165 759	Ce,-	2	4165 759	, Ce	1
37	4167 737		1Nd ?	4167 737	Y Ru?	1Nd ?
37	4168 025		2	4168 025	Ce-Fe	2
37	4168 133	Ni	2	4168 133	Ni, C	2
37	4171 854 <sup>1</sup>	Cr, La, Mn, Ni, Fe	2	4171 854	C, Fe?	2
37	4172 211	Al?	1	4172 211	Al	1
37	4172 296	Fe	2	4172 296	Fe Ce	2
37	<sup>1</sup> Probably due to some common impurity of unknown origin or Si? The gallium line is in this region, but I have no specimen of gallium with which to determine its exact position. The Fe line is strong enough alone to account for it.			<sup>2</sup> Note at bottom of page 37 should be struck out. The line is mostly if not wholly due to carbon (or cyanogen).		
38	4177 698	Fe	3	4177 698		3
38	4177 772		3	4177 772	Fe*	3
40	4207 566	Fe	1N	4207 566	(	1N

\*See remarks at the beginning of this table

SECOND PART—*Concluded*

				Corrections and Additions		
Page	Wave length	Substance	Intensity and Character	Wave length	Substance	Intensity and Character
41	4233 328	Mn-Fe	4	4233 328	Mn	4
42	4239 890	Mn	3	4239 890	Fe, Mn	3
42	4246 996	Y?	5	4246 996	* Sc	
				* One of the strongest lines in the spectrum of scandium		
45	4280 027		1	4280 027	Fe,	1
45	4280 374		1	4280 374	, Fe	1N
45	4285 966		1	4285 966	Co	1
45	4288 310	Ti	1	4288 310	11, Fe	1
46	4299 803	Ti	2	4299 803	Fe, Ti	2
46	4304 729		2	4304 729	Fe,	2
56	4455 980	Mn	2	4455 980	Mn	2
56	4456 064 s	Ca	3	4456 064 } s	Ca	3
56	4459 525	Fe, Cr	1	4459 525	Ci	1
57	4464 938		1	4464 938	Fe	1
58	4482 338	, Fe	5	4482 338	Fe,	5
59	4497 023 s	Cr	3	4497 023 } s	Cr	3
59	4497 138	Zr	0	4497 138 } s	Zr	0
59	4501 448	11,	5	4501 445	Ti,	5
62	4546 129	Fe, Cr	3	4546 129	Ci	3
80	4914 150		2	4914 150	Ni	2
81	4934 214 } s	Ba	3	4934 214 } s	Ba Fe ?	6
81	4934 277 } s		4	4934 277 } s		
				* This is probably a barium line with another narrower line (probably iron) at the red edge		
92	5209 779		0000	5209 779		0000
96	5328 696	Fe	2	5328 696	} * Fe	5
96	5328 696	Fe	2	5328 696	} * Fe	5
				* Measured as double, but probably reversed in Sun		
109	5646 039		00	5646 049		00
110	5682 427		2	5682 427	Ni	2
111	5693 330		0000	5693 350		0000
113				5754 222	A ?	000
114	5788 990	A (O)	00	5788 983	A (O)	00
114	5789 418 *	A (O)	00	5789 415 *	A (O)	00
118				5889 972	A (wv)	1N
118	5896 155	Na	20	5896 155 D <sub>1</sub> s <sup>3</sup>	Na	20
118	5896 35 D <sub>71</sub> s <sup>3</sup>		00N	5896 357		00N
120	5918 635	A (wv)	4	5918 635	A (wv)	4d
122	5974 094	N	0000	5974 094		0000N
122	5974 812	N	0000	5974 812		0000N
126	6090 429	Fe	2	6090 429	Ti, V	2
129	6252 773 s		7	6252 773 s	Fe	7
131	6298 666	Co, A (O)	2	6298 666	Ni, A (O)	2
136	6609 360 s		3	6609 360 s	Fe	3
146	7140 568	A	000N	7140 560	A	000N